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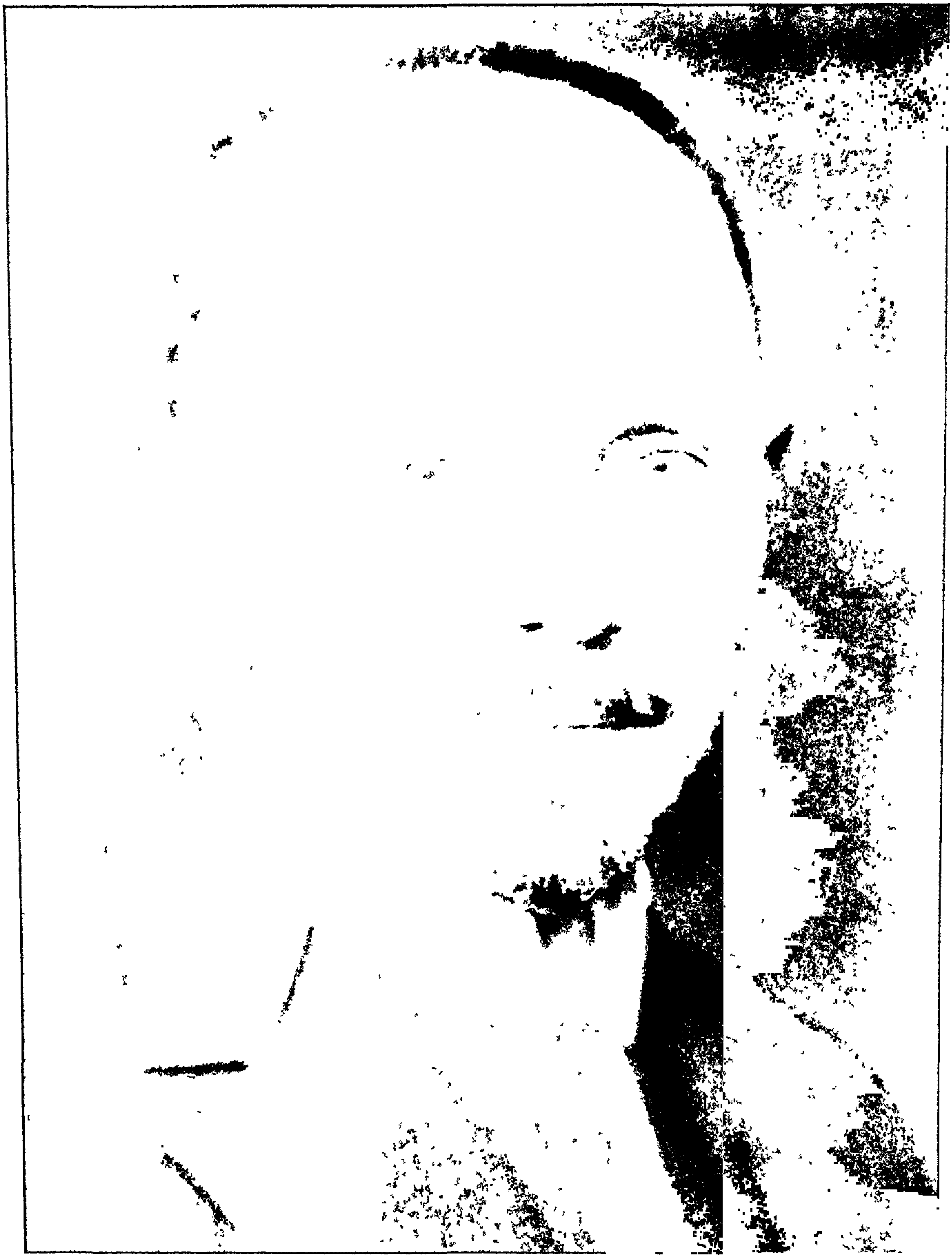

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Original Articles

Treatment of Cancer of the Lip

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CANCER of the lip accounts for approximately 2.3 per cent of all cancers.[1] Owing to its accessibility, cancer in this location should be diagnosed early and appropriately treated. It is surprising, however, how frequently intelligent patients permit cancer of the lip to develop extensively and remain untreated for long periods in spite of the fact that the lesion must certainly be observed several times each day. All too frequently the patient's physician[2] does not recognize the seriousness of the lesion and therefore shares the responsibility of delay in treatment; far too often he only administers ineffectual pastes, escharotics, ointments, small doses of radium or roentgen irradiation or light electrodesiccation, which merely serve to stimulate the cancer to more rapid growth and earlier metastasis.

The lower lip is the site of this malignant lesion in about 95 per cent of cases. The disease is practically limited to the male[3]; only 4 per cent of the patients in this group were female. Negroes are seldom affected.

Incidence and Etiologic Factors.—The mucous membrane of the lip, like the skin of the face and hands, is subject to the vicissitudes of weather and trauma. Cancer of the lip is most frequently encountered in persons who have thin, dry skin[4] and are much exposed to intense sunlight. In a study of 311 histologically proved labial cancers it was noted that 42 per cent of the patients had benign lesions before definite ulceration and induration began. These were warts, fissures, papillomas, scaly areas, cutaneous horns or keratoses and had been present for periods varying from a few weeks to many months. In 22 per cent of cases there was a history of trauma prior to the appearance of the tumor. The injuries were due to such causes as wearing poorly fitting dentures, [illegible] nails in [illegible] mouth, stabbing the [illegible] fork [illegible]

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Fig. 1.—Squamous cell carcinoma, Grade I, developing in keratotic area involving almost the entire upper lip.

eating, cutting the lip while shaving, tooth extractions, cigarette burns, or the lesions of herpes. Formerly smoking was thought to act as a predisposing factor, but since about 80 per cent of the adult population smoke[5] and 30 per cent of the patients in this series did not smoke, this cannot be listed as a direct causative factor except in the case of a patient who held a pipe constantly in the same position.

Formerly syphilis also was listed as a causative factor[6]; in this group it was encountered no more frequently than in the general population.[7] Nine patients in this series were treated by their family physicians for syphilis until their labial cancers had grown extensively, and in 6 of these metastases had developed during treatment.

Anatomy, Histopathology and Lymphatics of the Lip.—Malignant tumors of the lip are of the squamous cell variety and originate on the mucous membrane of the vermilion border. Not infrequently basal and squamous cell epitheliomas are encountered which involve the skin of the lips and extend to the mucous membrane; but, strictly speaking, these are not lip cancers.

Carcinomas of the lip vary in histologic degree from the well differentiated Grade I to the highly anaplastic Grade IV. About 80 per cent are well differentiated and are either Grade I or Grade II. Therapeutic agents such as electrodesiccation, inadequate irradiation or escharotics, when used indiscreetly or in the presence of acute inflammatory conditions, increase the activity of the growth. This was shown by Figi and others[8] and has been substantiated by us on numerous occasions.[9] When such lesions are incompletely treated, growth increases markedly, with a greater likelihood of metastasis. It was observed in this, as well as in other groups of cases reported,[10] that cancers involving the commissures and the upper lip metastasize earlier, grow more rapidly and are more difficult to control.

The lymphatics of the lip were discussed in detail in previous reports.[11] A *résumé* will be given here. The lymphatics form a fine capillary network on the vermilion border[12] and combine into collecting trunks. The trunks from the lower lip pass to the mental, submental and submaxillary nodes. There is a free anastomosis across the midline which accounts for bilateral metastasis, especially from cancers located in the middle third of the lip. The lymphatics of the upper lip and the commissures pass to the preauricular, postauricular, intraparotid, submaxillary and submental nodes. It has been shown that the collecting trunks from the lateral third of the lower lip enter the mental foramen in 22 per cent of cases, accounting for early involvement of the mandible in some instances.

Any lesion on either lip which persists for six to eight weeks should be considered a cancer until proved otherwise. Thin-skinned persons who are subject to intense sunlight frequently have keratosis of the lower lip; in some cases the entire lower lip is involved. After varying periods one area of the keratosis will indurate, thicken and ulcerate, signifying malignant transformation. A cancerous ulcer that originates in keratosis develops, as a rule, very slowly and appears only slightly lower than the surrounding lip surface, but there is definitely a zone of induration beneath it. It is not uncommon to see a small, ulcerated lesion of this type, less than 1 cm. in diameter and 4 or 5 mm. deep, with an indolent appearance, which, on careful examination, will be found to have metastases to the lymph nodes.

Another type of cancer of the lip develops over a larger part of the lower lip at one time (Figs. 1 and 2). This type of tumor frequently begins in an area of chronic leukoplakia with induration beneath it, resulting in an ulcer[13] and occasionally extending over the entire lower lip; these ulcers are not very deep.

Occasionally leukoplakia occurs on the mucosal side of the lip, merging into keratosis along the exposed vermilion border Histologically the two processes leukoplakia and keratosis, are the same, on the exposed, dry surface the thickened skin cracks and scales off, fissures often develop

Such lesions as papillomas or cutaneous horns, when allowed to remain on the lip, after a variable interval become thickened and indurated around their edges, this signifies malignant transformation [14] Not infrequently these cancers become large and bulky Fortunately, tumors that grow away from the surface *are much less malignant than those growing* toward or into the body It is not uncommon for large, bulky tumors of the lip to be present for considerable periods without metastases [15]

Fissures on the lip, which frequently occur in the commissures, should be looked on with suspicion Persistent fissures require surgical excision before malignant change takes place Any ulcer or fissure with induration around the border, even though the growth is microscopic, should be examined by biopsy to determine whether malignancy is present

One type of lip cancer develops rapidly This usually begins as an indurated ulcer which spreads quickly simulating inflammation Within a few months the ulcer may destroy a large area of the lip and fix the lip to the periosteum of the mandible (Fig 4 *A* and *B*) Such a tumor may be surrounded by an area of induration measuring 1 cm or more and appearing inflamed This indurated *area contains cancer cells*—an essential point to be recognized, since to effect a cure, surgical removal of this indurated area of tissue or *adequate roentgen irradiation of it* is necessary [16]

A small per cent of cancers of the lip with indurated margins that are well circumscribed, ulcerated and chronically inflamed may clinically simulate tuberculosis syphilis or inflammatory ulceration Histologic examination of adequate material will give the correct diagnosis

The patients in this series of cases were divided into two groups (*1*) those who had received no previous treatment before consulting our clinics (primary group) and (*2*) those

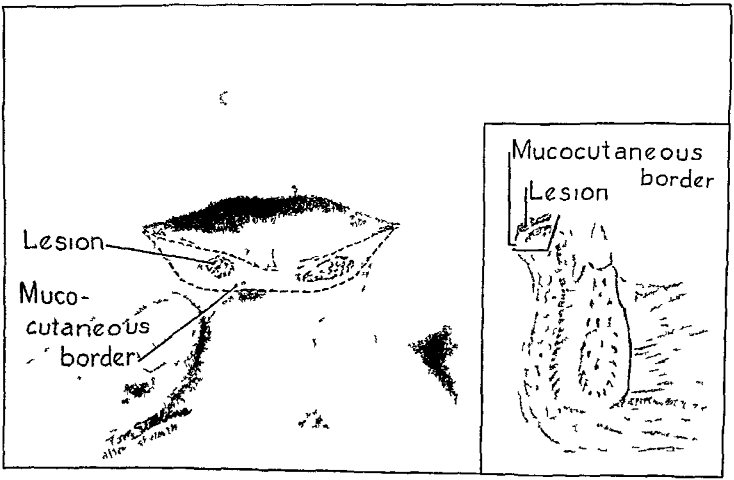

Fig 2 —Artist's representation

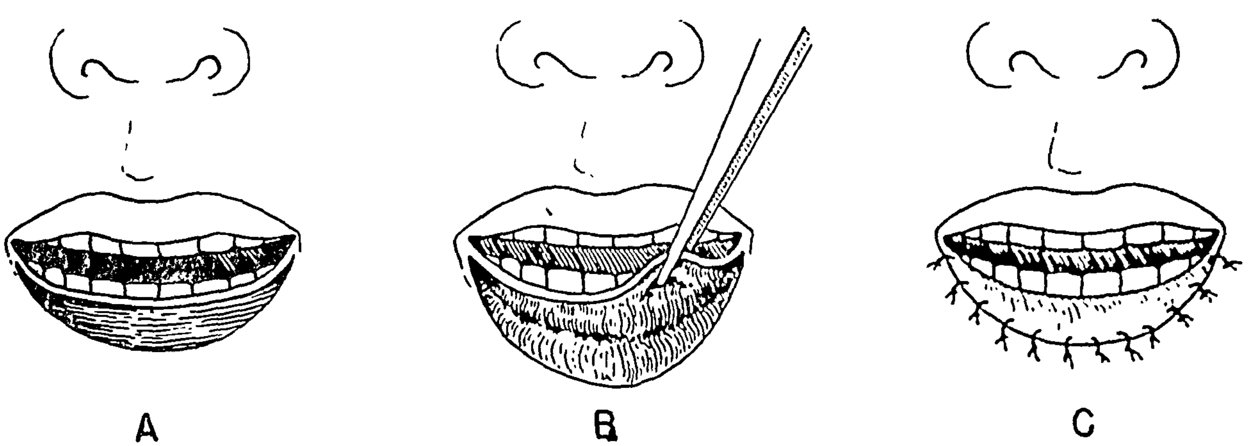

Fig. 3.—Surgical procedure advocated for excision of type of tumor in Figs. 1 and 2. Any remaining area of keratosis or leukoplakia is removed. The mucous membrane is advanced and sutured to the skin, giving a good cosmetic result and a low rate of recurrence.

who had received previous treatment for varying periods with cancer paste, radium, electrodesiccation or surgical excision (secondary group). Patients in the secondary group had lip lesions of much larger size and higher histologic grade than those in the primary group; they also showed a larger per cent of metastases to the lymph nodes of the neck.

Diagnosis.—The curability and cosmetic results depend entirely on early diagnosis and adequate treatment of the lip lesion and on whether metastases are present in the lymph nodes of the drainage area.[17] Cancers of the lip, because of their superficial location, favor early observation and lend themselves to easy examination. Premalignant lesions, such as papillomas, cutaneous horns, epithelial warts, keratosis, leukoplakia and chronic fissures, should be observed closely and removed before malignant transformation takes place.

It cannot be stressed too often that every tumor on the lips which has the appearance of a malignant growth, either proliferative or ulcerative, should be subjected to adequate biopsy. Unfortunately, it has been the policy of some clinicians to treat lip cancers, as well as tumors of the skin, with "a little radium" or "x-ray" without positive histologic examination. This approach is so unscientific that it should not even be discussed in scientific literature; but, because of the frequency of the practice, comment must be made. For example, if a tumor is benign and the patient receives a cancericidal dose of roentgen therapy, his lesion is being overtreated; on the other hand, if the lesion is malignant and the irradiation is given only for a benign lesion, the malignant tumor will continue its growth with increased rapidity.[18] The value of adequate biopsy outweighs any hypothetical danger of dissemination of the cancer or a poor cosmetic result. It must be stressed that adequate material should be taken for biopsy, since the pathologist can only pass on material submitted to him, and for this reason he must have tissue typical of the disease. The problem of biopsy is well illustrated by 97 cases in this series, in which the patients had received previous treatment elsewhere but in which only 27 biopsies had been done. In examining the lesion on the lip it is imperative to determine width, depth, the presence or absence of an indurated area around the lesion and the presence or absence of enlarged lymph nodes in the suprahyoid area.

We previously reported that approximately 40 per cent of normal persons will prove to have palpable lymph nodes in the suprahyoid space if this area is examined with diligence.[9] We demonstrated our routine method of palpating the lip lesion between the thumb and finger and the method of determining whether the lesion is plastered to the mandible and how far or how deep the induration is present around the lesion. The lymph drainage area is then carefully examined by having the finger

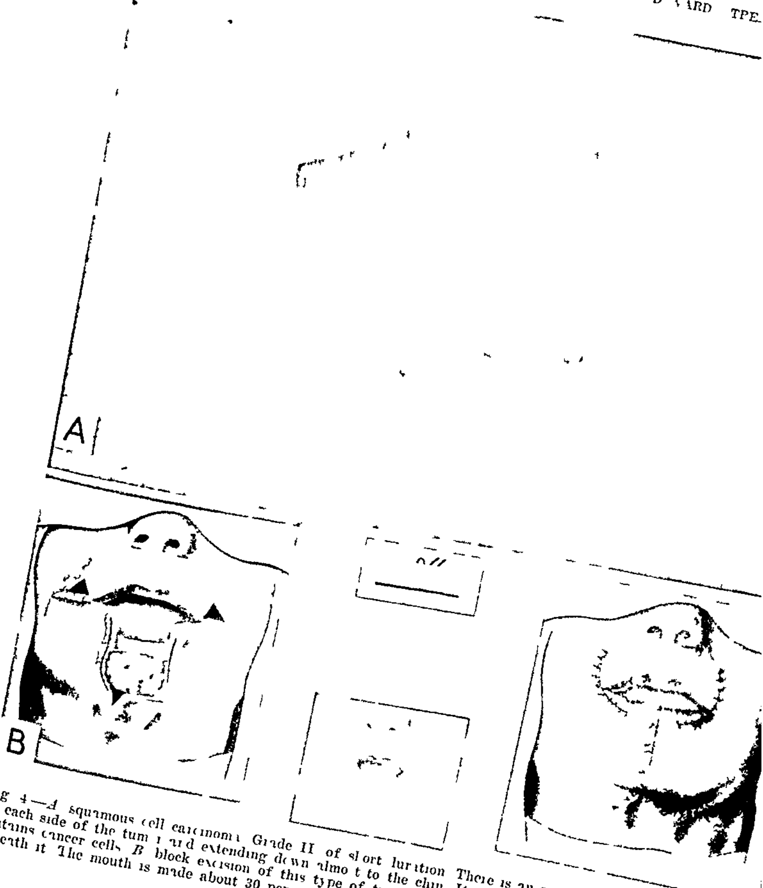

Fig 4—*A* squamous cell carcinoma Grade II of short duration There is an area of induration about 1 cm on each side of the tumor and extending down almost to the chin It is necessary to remove this area, which contains cancer cells *B* block excision of this type of tumor, with allowance of a wide margin around and beneath it The mouth is made about 30 per cent smaller the lips are pliable, and there is a good cosmetic result

of one hand in the mouth and the fingers of the other hand beneath the chin and mandible, this permits the floor of the mouth to be palpated bimanually starting in the midline and proceeding backward on each side while the patient flexes his head forward, thereby permitting the muscles in the suprahyoid area to become relaxed and allow accurate palpa

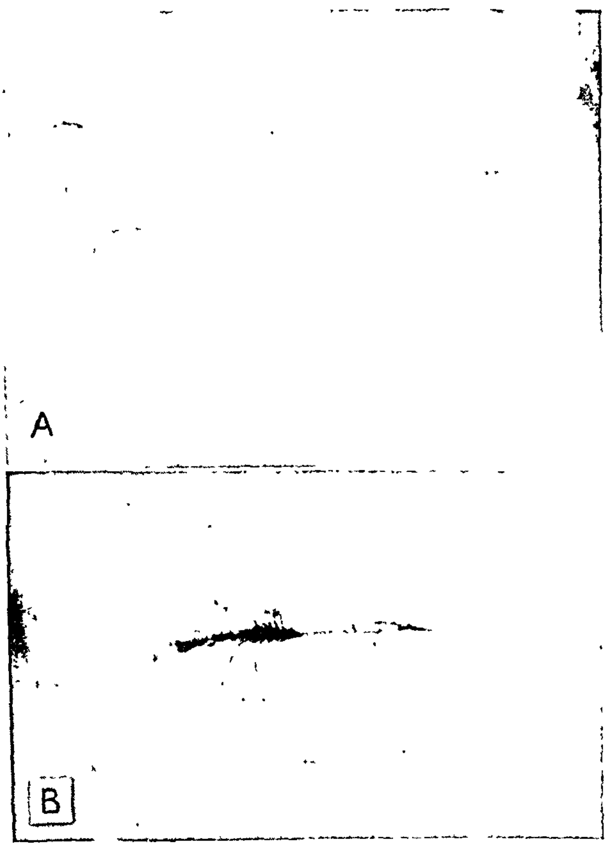

Fig. 5.—*A*, squamous cell carcinoma of the lateral third of the lower lip, 2.5 cm. in diameter. There are no palpable lymph nodes in the suprahyoid area. *B*, tumor treated with roentgen therapy (6,000 roentgens), with allowance of a good margin on each side. No recurrence after five years. (From Ward and Hendrick, *Tumors of the Head and Neck*. Reproduced by courtesy of the Williams and Wilkins Company, Baltimore.)

tion of the submaxillary contents. If the cancer is located on the upper lip or in the commissures the preauricular, postauricular and interparotid regions should be examined in addition. After this maneuver the jugular chain of nodes should be examined from the angle of the jaw to the clavicle along the anterior border of the sternomastoid muscle.

Since the prognosis of labial cancer depends on accurate control of the primary lesion, whether the lymph nodes in the drainage area are involved and how promptly and effectively they are treated, it is important to determine, if possible, the presence of metastatic nodes.[19] In large ulcerative cancers of the lip the lymph nodes are frequently infected and may be enlarged as a result of metastatic inflammation from the lip lesion. Such nodes are tender and firm; they may be several centimeters in diameter, knotted together, painful and fixed. There may be evidence of inflammation, e.g., cutaneous erythema over the nodes. The mouth should also be examined to determine whether infection is present which may be producing inflammation in the lymph nodes.

If the cancer is located on the lateral third of the lower lip, roentgen examination of the mandible should be made to determine whether it is involved. Thirteen patients in this series had involvement of the mandible; 5 of these had a direct extension of the tumor to the mandible, and 8 had metastases through the mental foramen. One of the first signs of involvement of the mandible by metastasis is paresthesia of the lip and "toothache." When pressure is produced by palpating the mandible with one finger on its inner surface and the thumb on the outside, pain is elicited if the mandible is involved.

Treatment.—It is important to consider the following factors in planning therapy for cancer of the lip: (*1*) whether the patient has received previous treatment; (*2*) the size of the lesion (Table 2) and its histologic grade; (*3*) the age of the patient and his general physical condition; (*4*) whether there are metastases in the drainage area and whether they have extended to involve the jugular chain of nodes, and (*5*) whether there is involvement of the mandible. A large percentage of the primary tumors in this series that had received no previous treatment were well differentiated tumors of Grades I and II. The secondary group that had received previous treatment, such as inadequate irradiation, electrodesiccation or surgical excision, were of a higher histologic grade. Most Grade I and II lesions respond and are well controlled by either surgical exision or adequate irradiation. The Grade IX lesions metastasize early and probably are best managed with roentgen therapy to the primary lesion and suprahyoid dissections of the neck.

Treatment by Irradiation.—Roentgen therapy is a valuable modality in the treatment of cancers of the lip[20] under 1.5 cm. in diameter and not over 4 mm. in depth. It is especially valuable[21] for elderly patients in poor physical condition and for patients who refuse surgical excision. However, it must be stressed that therapy is administered only after adequate biopsy and determination of the histologic grade of the tumor. We have successfully treated such lesions with 6,000 to 7,000 roentgens of unfiltered irradiation including a margin of 1 cm. on each side of the growth. The therapy is usually given in four [illegible] sittings spaced at two-day to three-day intervals, a lead shield being used between the lip and the mandible to protect the teeth and the mandible (Fig. 5, *A* and *B*). In some instances, if it is impossible for the patient to be treated every second or third day for four treatments, the entire amount of irradiation can be given at one sitting; however, our results show that it is more beneficial to space the treatments." Since cancer cells divide two to four times a day, depending on their cellular differentiation, it is our opinion that if the irradiation therapy is divided into several sessions, cells that are not destroyed by the first or second treatment will be destroyed subsequently. It usually requires three to four weeks for the reaction produced by adequate roentgen therapy to subside.

If the tumor has extended over 5 mm. in depth there is, as a rule, involvement of the orbicularis oris muscle.[23] If such a cancer is eradicated with roentgen therapy a defect results, necessitating plastic repair to prevent drooling of saliva. Neither is roentgen therapy as successful in eradicating smaller cancers of the upper lip or cancers located in the commissures as in disposing of those on the lower lip. It cannot be too frequently stressed that cancers must receive the entire amount of therapy in one series of treatments. Formerly, some roentgenologists spaced treatments from six to twelve weeks apart, but such ineffectual treatment only makes the cancer more resistant to irradiation.

In former years radium, in the form of placques, moulages, and radium tubes,[24] or the inhuman implantation of radium needles in the lips for several days at a time was employed, but this has now been discarded except, perhaps, in isolated areas where efficient roentgen therapy is disregarded. Del Regato[20b] stated in 1948 that "five years ago we discontinued the use of radium in our hospital in the treatment of cancer of the lip in favor of roentgen therapy." The same effects and better results can be obtained with roentgen therapy, when indicated, than with the use of radium in any of the aforementioned forms. Roentgen therapy may be administered with greater ease and more accurate dosage, without the risk of extensive infections and sloughs,[25] which frequently accompany radium therapy even with radium needles of low intensity. In addition, the mandible can be better protected with roentgen therapy, and the resulting scar is more pliable, softer and less likely to break down than are the scars remaining from radium therapy. The deleterious effects, from a cosmetic standpoint, and the cancers that persist after radium therapy probably are factors that cause many patients' reluctance to seek medical advice early for cancer of the lip. One need only see the large lip defects and destruction of the mandible resulting from radium therapy to be able to appreciate their point of view.

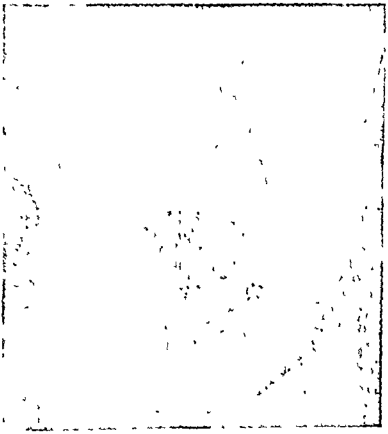

Fig. 6.—Squamous cell carcinoma, Grade II, involving one fourth of the lower lip, with no palpable lymph nodes in the drainage area.

Surgical Treatment: Cancers of histologic Grades I and II which do not involve more than one-fourth of the diameter of either lip and do not infiltrate the lip deeper than 1 or 1.5 cm. a[illegible] by a V[illegible] surgical

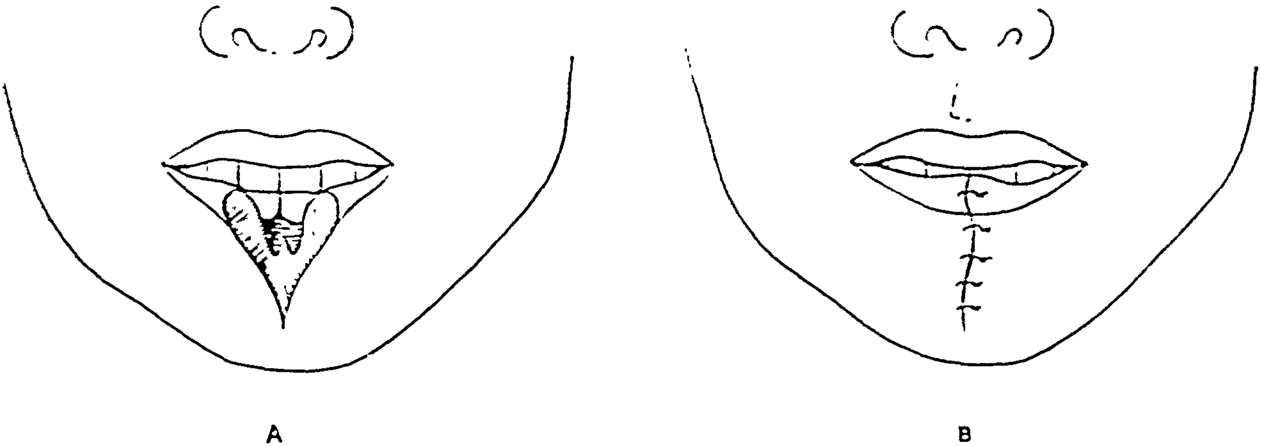

Fig. 7.—V-shaped surgical excision, of tumor in Figure 6, with wide margin around the tumor.

excision (Figs. 6, 7 and 8). A safe margin of at least 0.5 to 1 cm. is allowed around and beneath the tumor, especially if the tissues immediately surrounding it are indurated.[28] If care is used in suturing the mucocutaneous junction of each side accurately, there will be good cosmetic results. This type of procedure may be carried out with infiltration anesthesia in a minor operating room.

Another group of cancers of the lower lip that have origin in keratosis or leukoplakia, which extend to involve most of the diameter of the lip and do not infiltrate over 4 or 5 mm. in depth, can be eradicated by excision of the lesion. A margin should be allowed on each side and beneath it (Figs. 1 and 2). The mucous membrane is advanced from the inner surface of the lip and resutured to the skin to form a new mucocutaneous junction.[26] Thus, not only the tumor but any part of the vermilion border that might later become involved in a malignant process is removed. This procedure and the V-shaped excision give excellent cosmetic results and do not change the contour, appearance or width of the oral fissure.

Lesions of the upper lip that are 1.5 to 2 cm. in diameter and 1 cm. deep are best removed by the Abbey technic[9] (Figs. 9, 10 and 11). A V-shaped excision, with a wide margin on each side and beneath the tumor, is made with the region under infiltration anesthesia. Since the upper lip is relatively smaller than the lower, the sacrifice of too much tissue may leave it too narrow. In this case a V-shaped flap is made in the lower lip opposite the area in the upper lip where the tumor was removed; this flap is left unattached on one side, with a good margin, and sutured into the defect in the upper lip. The lips are held together for ten days, during which time the patient is permitted a high-concentrate liquid diet. At the end of this time the flap is severed from the lower lip and any adjustment of it is made. Good cosmetic results are obtained with this procedure.

Large cancers of the lateral third of the lower lip, if removed with a wide margin, leave a marked defect; however, these can be safely removed by excising the lesion with a good margin of tissue on each side and beneath it and bringing down a full-thickness flap from the upper lip. This technic was described in a previous report.[11] The operative side is left shorter, but this is necessary in order to remove these large cancers and is safe because it permits adequate removal of the local lesion. The cosmetic results are relatively satisfactory.

Tumors of the lower lip that involve one half of the lip and extend in depth to the chin are removed as shown in Figure 4, *A* and *B*. A rectangular defect is left. To correct this, a small triangle of tissue is removed from each side of the upper lip, and the mucous membrane of the lower edge of this defect is brought out and sutured to the skin to re-form a vermilion border. These triangles are closed in layers with No. 0 catgut in the submucosa and muscular layers and [illegible] black silk in the skin The [illegible] in the lower lip is closed b[illegible] triangle from each side of [illegible] converting the rectangular defect [illegible] triangular one This technic is very use[illegible] lesions, the cosmetic result [illegible] the orbicularis oris muscl[illegible] mouth is made about 30 p[illegible] the lips remain flexible

Large lesions of the upper lip resulting either from lip cancer or [illegible] of the upper lip in which [illegible] of the lip is involved and which infiltrate [illegible] may be corrected by the [illegible] of Denonvilliers or the [illegible] procedure Perhaps the Denonvilliers technic (Fig 12 and [illegible]) is preferable The tumor [illegible] margin vertical flaps are [illegible] full thickness of the [illegible] a pedicle below The [illegible] flap extends from the [illegible] the [illegible] nose to the lower border of the [illegible] Transverse incision[illegible] extended from [illegible] upper border of the d[illegible] eral incisions forming [illegible] flaps are brought together in th[illegible] the skin sutured with [illegible] of black silk The [illegible] is reconstructed [illegible]

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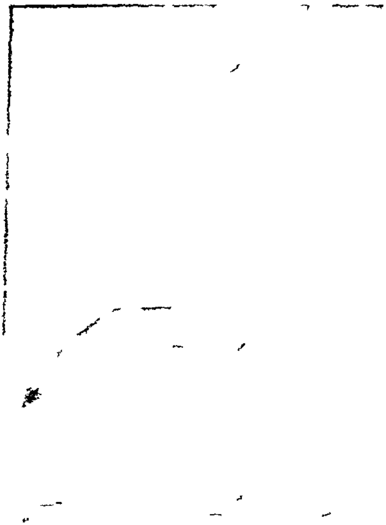

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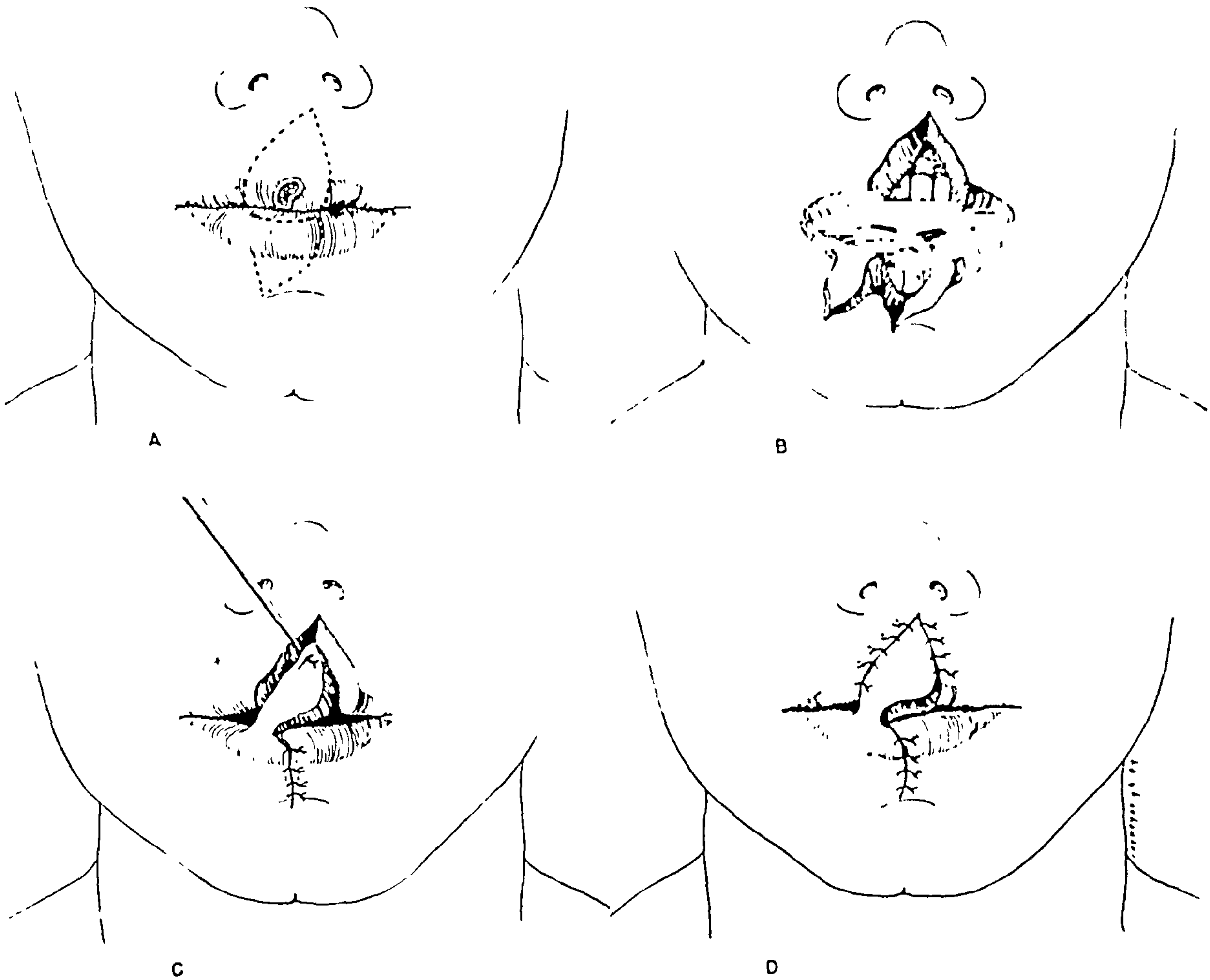

Fig. 10.—Tumor in Figure 9 removed by Abbey type of procedure, a wide margin being allowed around and beneath the lesion; flap brought up from lower lip and sutured in place; pedicle of flap severed ten days later and flap trimed.

dible if necessary. If only the outer table of the mandible is involved, it is removed and the inner table permitted to remain and regenerate. However, if the entire thickness of the mandible is involved,[28] which was true in 4 per cent of this series of cases, it also is removed. Frequently rather large defects are left in the lips and cheek; these may be closed by a tubed pedicle graft from the chest[29] or occasionally from the neck.

These extensive tumors may also involve the cervical lymph nodes in the suprahyoid area and/or the deep jugular chain; in these cases a dissection of the neck is carried out in conjunction with resection of the tumor and mandible (Figs. 14, 15 and 16). The pedicle graft from the chest can be prepared during the interval between irradiation therapy and electrosurgical removal of the tumor. Cosmetic results in such cases are only fair, since the oral fissure is markedly altered; however, curability is relatively good.

Treatment of Cervical Lymph Nodes and Cervical Metastases: Although practically all deaths from cancer of the lip are produced by cervical metastases, fortunately these cancers do not metastasize to the cervical lymph nodes as often and as rapidly as do those of the tongue and of the floor of the mouth; therefore the disease remains localized to structures above the clavi[illegible] period[30] The development [illegible] ment for metastatic cancer [illegible] lymph nodes is attributed to [illegible] Cheatle and Kocher These [illegible] derstood the cervical lymph[illegible] in which the disease spread [illegible] necessary to eradicate it

Prophylactic treatment [illegible] nodes and cervical metast[illegible] cussed in the literature [illegible] merly some advocated ir[illegible] roentgen) in the prophyla[illegible] of cervical metastases It [illegible] that small doses of irradiation [illegible] 2 000 roentgens) or a comparable [illegible] radium on each side of the neck [illegible] prophylactically sterilize the node bearing areas Further endeavors were made to eradicate metastases when present, with irradiation either by radium packs radium needles or roentgen therapy, and some cures were reported However these reports were not substantiated by biopsy of the cervical nodes under treatment It is well established that a dose of 6 000 to 7 000 roentgens is required to eradicate even small primary cancers of the lip and therefore it is impossible to imagine the neck being sterilized or metastatic cells in the lymph nodes being destroyed by prophylactic doses of 1 500 to 2 000 roentgens to the skin Adequate treatment of the primary lesion has been repeatedly demonstrated as the best prophylaxis for cervical metastases If this is accomplished little danger arises that metastatic emboli will break off and involve the lymph nodes in the drainage area

Blair and Brown as well as others[1] express a definite opinion that in cases of lip cancer in which there is a reasonable chance of curing the primary lesion, a dissection of the lymphatic areas of the neck should be carried out regardless of whether clinical involvement of the cervical nodes is demonstrable Lack of clinical enlargement of the lymph nodes does not necessarily mean that metastases are not present, and the patient should not be denied the improved prognosis that dissection of the neck may offer Blair and Brown stated that 20 per cent of patients with lip cancer have [illegible] involvement of the nodes Kennedy[illegible] noted involvement of the cervical lymph nodes [illegible]

[illegible] per cent [illegible] observed [illegible] ment to be [illegible] bone by routine [illegible] whether [illegible] treatment of lymph [illegible] most [illegible] surgical measures [illegible] to follow when the [illegible] clinically involved We have [illegible] elastic rules for suprahyoid [illegible] the neck In addition to [illegible] the neck we take into [illegible] the [illegible] grade of the lip [illegible] size and duration and the age and physical condition of the patient we also attempt to discover whether the patient will cooperate in systematic follow up If he comes from a remote area or if he appears uninterested in a systematic followup we find it necessary for his protection to do a prophylactic suprahyoid dissection of the neck

Criteria for Dissection of the Neck Patients with squamous cell carcinomas of Grades I and II less than 2 5 to 3 cm in diameter but without palpable nodes in the suprahyoid area are not advised to have dissections of

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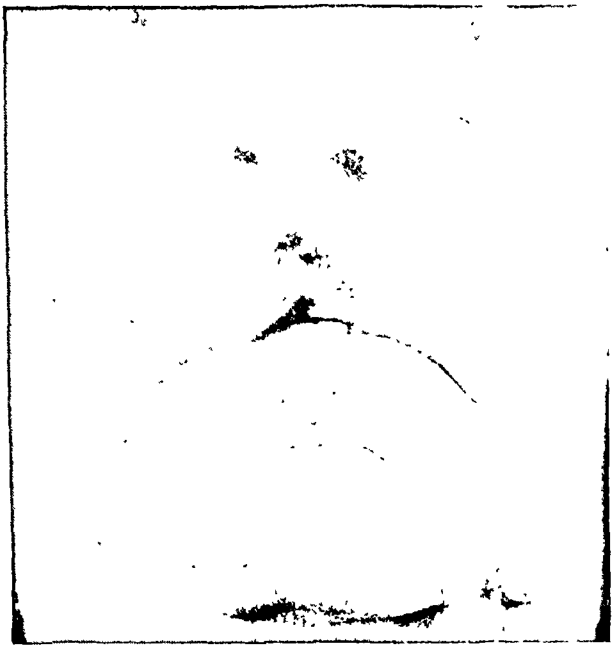

Fig. 12.—Carcinoma involving middle third of upper lip with wide zone of induration surrounding tumor.

the neck. We have found that this indolent type of cancer does not metastasize for a long time unless inflammatory reaction is stimulated by inadequate treatment with caustics, radium, roentgen therapy or desiccation.[11] If the primary lesion is badly inflamed, suprahyoid dissection of the neck should be carried out (Fig. 17).

We do not advise routine dissections of the neck for Grade I or Grade II lip cancers under 2 cm. in diameter when clinically involved nodes are not present in the suprahyoid drainage area, but we do advise the patients to be observed every two months the first year, every three months the subsequent year and every four months thereafter for five years. If nodes are clinically enlarged in either of these two groups, dissection of the suprahyoid neck is carried out. On the other hand, patients with lip cancers of Grade II or Grade III, over 2 cm. in diameter, of short duration and rapid growth, without clinical evidence of involvement of the lymph nodes, are advised to have routine suprahyoid dissections of the neck.

Suprahyoid neck dissection is advised for labial epitheliomas of long duration and of any histologic grade if they are over 3 cm. in diameter, even though no palpable nodes are present; we have frequently observed microscopic involvement of the lymph nodes in these large tumors.

Patients of advanced age with early metastatic involvement of the cervical lymph nodes should be treated by suprahyoid dissection of the neck with infiltration anesthesia if their general physical condition will permit.

Markedly undifferentiated primary lip cancers[11] probably are best treated with intensive roentgen therapy to the primary growth, followed by routine dissection of the suprahyoid neck after the primary lesion is completely healed.

If the cancer involves the lateral third of the lip and enlarged nodes are palpable on the side of the growth, suprahyoid neck dissection is limited to the involved side. However, if a malignant growth involves the middle third of the lip with nodes palpable on either side, a bilateral suprahyoid neck dissection is carried out. When involved nodes are found on one side of the neck on frozen section, the neck dissection is extended to take in the jugular chain of nodes, including the sternomastoid muscle, the internal jugular vein and the lymph-node-bearing fascia from the clavicle to the mandible on that side.

Contraindications to neck dissection exist when the suprahyoid and jugular chain of nodes is involved bilaterally; when the primary lip lesion is uncontrolled;[15] when distant metastases are present; when the patient is in poor general physical condition; when the primary lesion of the lip extends beyond the oral cavity, or when it is felt that the nodular capsule has been infiltrated and necrosis has occurred with involvement of the overlying skin.

Occasionally cases are observed in which the primary labial lesions remain healed but the patient returns with a group of nodes showing necrosis and involvement of the skin. If the enlarged nodes are limited to the suprahyoid area, it has been our policy to treat the patient as Quick suggested some years ago.[36] An incision is made over the necrotic mass and all necrotic tissue is curetted away. The capsule is then implanted with low intensity radium needles or the wound is treated with high voltage roentgen therapy (5,000 to 6,000 roentgens). After six to eight [illegible] volved area is removed electrosurgi[illegible] radical dissection of the neck is [illegible] provided that the opposite side [illegible] free from obvious involvement [illegible] there is such extensive destruction [illegible] that a pedicle graft is required to [illegible] defect. This is well illustrated in Figu[illegible] and 19; in this case metastases to th[illegible] developed at the angle of the mandible after the primary lesion had been treated elsewhere with radium three years before. The necrotic tissue was excised and curetted away. The remaining capsule was then treated with low intensity radium needles followed by irradiation therapy. Eight weeks later the entire involved mass was removed electrosurgically and a radical dissection of the neck was done A pedicle graft was then used to close the defect, and the patient was well, with no evidence of recurrence, seven years later

It is our opinion that involvement of the suprahyoid lymph nodes represents metastatic emboli from the lablipial cancer and that the lymphatic channels in the tissue between the labial lesion and the suprahyoid nodes are not necessarily involved as in the case of carcinoma of the breast. If the lesion is treated with roentgen therapy and a suprahyoid dissection of the neck is indicated, it is our policy to wait until the primary lip lesion is com[illegible] dissection is done, [illegible] to six weeks How[illegible] [illegible] treated surgically [illegible] the neck is carrie[illegible] [illegible] which spares the patient [illegible] Judd and Beahrs,[8b] Blair, Brown and McDowell,[38] Figi,[illegible] [illegible] and Byars[14a] Wangensteen and [illegible] Dixon[2] [illegible] and Kennedy[40] have all [illegible] with this plan of management. On the [illegible] hand, Modlin,[illegible] Duffy,[41] Wile and Hand[illegible] and Martin[42] have expressed the opinion that dissection of the neck should be delayed until it is certain that the primary lesion of the lip is cured According to them, if infection is present in the lymph nodes as a result of infection of the parent tumor, time is allowed for it to subside after treatment of the labial lesion, which will permit a more accurate evaluation of the enlarged lymph nodes

COMMENT

This group of 311 histologically proved epitheliomas of the lips treated at the Johns Hopkins Hospital, the University of Maryland Hospital and in our private practice is all-inclusive.

The patients are divided into two groups (Table 4). (*1*) the primary group, composed of patients who had received no treatment

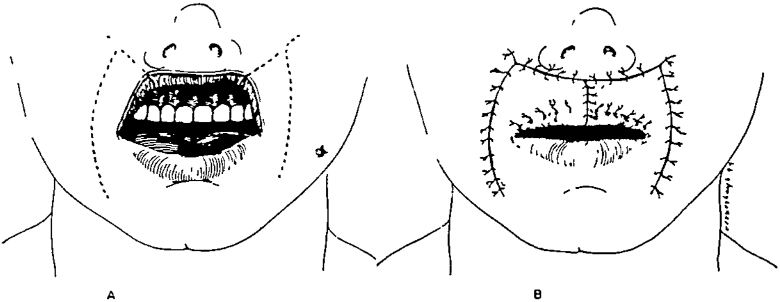

Fig 13.—Denonvillier's operation for removal of large tumors of upper lip. (The upper lip is not very pliable after this type of procedure, but it gives a safe margin around the tumor and a fair cosmetic result. From Ward and Hendrick, *Tumors of the Head and Neck* Reproduced by courtesy of The Williams and Wilkins Company, Baltimore)

TABLE 1.—*Three Hundred and Eleven Cases of Carcinoma of the Lip*

Patient's age, years	Number
20 to 30	5
30 to 40	15
40 to 50	65
50 to 60	66
60 to 70	86
70 to 80	62
80 to 90	12

TABLE 2.—*Relation of Size of Lesion to Curability*

	Primary Group		Secondary Group	
Size of lesion in (cm.)	Number of cases	5-year cure (per cent)	Number of cases	5-year cure (per cent)
	214		97	
Under 1	84	94	1	100
1 to 2	76	84	27	69
2 to 3	32	65	42	50
Over 3	22	46	27	39

other than with innocuous salves before consulting us; (2) the secondary group, who had received previous treatment in the form of radium or roentgen therapy, electrosurgical measures, escharotics or a combination of these.

For a number of years we have seen patients who have been treated elsewhere with irradiation and who have indurated, ulcerated lesions on the lips. Not infrequently these patients state that they have received radium therapy or, occasionally, roentgen therapy over a period of several years. An endeavor is made in these cases to discover from each patient's physician the amount of therapy he has received. Usually the treatment consists of 200-300 milligram hours of radium or roentgen therapy of less than 1,000 roentgens. In these cases adequate biopsy is essential to determine whether the malignant growth is still present or whether the induration and ulceration are the results of prolonged inadequate therapy which has produced obliterating endarteritis and fibrosclerosis. If malignancy is not present, the ulcerated area is widely excised and the necessary plastic procedure instituted to correct the resultant defect. If, on the other hand, malignant areas remain, surgical excision should be carried out, with allowance for a wide margin since further irradiation would be useless.

A small percentage of the patients in this series had more than one cancer of the lip; several had two, and 1 patient had three at the time of admission. An occasional patient returned with what was an apparent local recurrence near the site of the original lesion, but upon careful examination it was determined that the patient had actually a new cancer. In patients with extensive keratosis or leukoplakia a second cancer of the lip *not* infrequently develops at some distance from the primary lesion; in such cases it is essential that all keratotic areas be removed.

In a previous report[11] we discussed in detail the relation between the curability of the lesion, its histologic grade, its size, its duration, the presence or absence of "positive" lymph nodes in the drainage area and the administration or nonadministration of previous treatment. It was shown in that report, as well in this, that the primary group had by

TABLE 3.—*Lymph Node Involvement*

	Number	Per cent
Primary group (214 cases)		
Palpable nodes	91	43
Neck Dissections	71	33
Nodes resected, positive	30	42
Local recurrence	15	7
Recurrence in nodes	35	16
Died of cancer, 0 to 13 years	24	
Secondary group (97 cases)		
Palpable nodes	59	59.9
Neck dissections	61	62.8
Nodes resected, "positive"	37	60
Local recurrence	8	9
Recurrence in nodes	26	30
Died of cancer, 0 to 13 years	26	

TABLE 4.—*End Results in All Patients Treated*

	5-year cures (per cent)
Primary group, 214	78
Operation, 116	92
Irradiation, 69	79
Combined irradiation and operation	51
Secondary group	
All methods, 97	67
Total number, 311	73

far the better prognosis and cosmetic [illegible]

In the primary group of 214 pa[illegible] was a 78 per cent incidence of [illegible] year cure. One hundred and sixte[illegible] patients underwent surgical exci[illegible] primary lesion, with a five-year n[illegible] rate of 92 per cent; 69 were [illegible] irradiation, with a five-year n[illegible] rate of 79 per cent. Another [illegible] patients with more extensive carc[illegible] were treated with roentgen thera[illegible] intervention or both, showed a f[illegible] recurrence rate of 51 per cent

In the secondary group of 97 pa[illegible] who had been treated elsewhere for va[illegible]ng periods many of whom required multiple surgical procedures because of the extensiveness of their tumors, there was a five-year salvage rate of only 67 per cent.

The problem of handling the lymph nodes in the drainage area has been a controversial subject in the past. Table 3 shows our results, which substantiate our opinion that suprahyoid dissection of the neck is essential when indicated. In the primary group of 214 patients, 91, or 43 per cent, had enlarged lymph nodes on admission. Of these 71, or 33 per cent, underwent suprahyoid dissections of the neck. Of the group of 71 patients, 30, or 42 per cent, showed involvement of the nodes. That is, 14 per cent of the patients in the primary group had involved nodes on admission. In 35 patients, or 16 per cent, on whom prophylactic dissections of the neck had not been performed or in whose cases there was insufficient evidence to warrant the dissection on admission, recurrence in the nodes developed later. This results in a total of 30 per cent of the patients with labial cancer in whom the nodes were involved on admission or became involved subsequently.

Of the secondary group of 97 patients who had received treatment before admission and who had more extensive cancers of great duration, 55, or [illegible] per cent, had enlarged nodes. Of this group of 97 patients, 61 or [illegible] per cent underwent suprahyoid dissections of the neck. The resected nodes were "positive" in 37 or 60 per cent of the cases. [illegible] patients, or [illegible] per cent, who did not have prophylactic dissections of the neck or sufficient evidence to warrant such dissection on

Fig. [illegible]—[illegible]

admission had a recurrence in the nodes. In other words, [illegible] patients of the 97 comprising the secondary group showed involvement of the nodes either on admission or as a later development.

We contend that the condition of patients with cancer of the lip should have careful evaluation on admission, including biopsy of the primary lesion and meticulous examination of the lymph nodes in the drainage area, after which the lesion should be treated by the method best adapted to the patient [illegible]

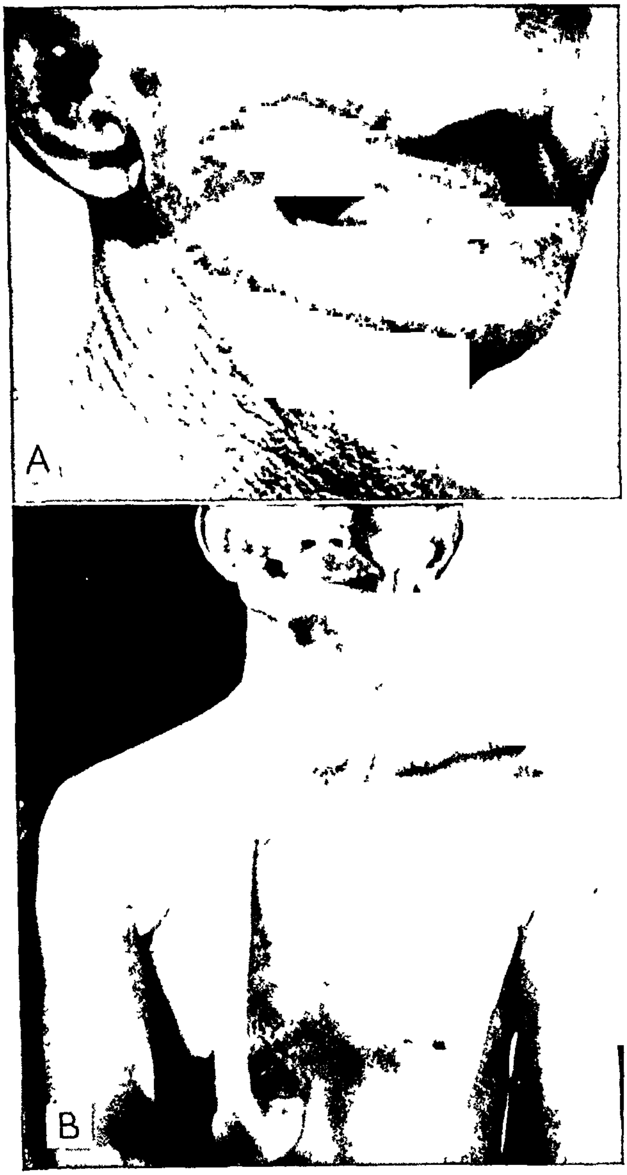

Fig. 15.—*A*, tumor treated with roentgen therapy (6,000 roentgens measured in air); six weeks later electrosurgical excision and radical dissection of the neck were carried out. *B*, pedicle flap prepared from chest wall, lower end of which was lined with split thickness graft to form lining of cheek.

wide margin being allowed around the tumor. Whichever therapy is employed, if there is evidence that the lymph nodes in the drainage area are involved a suprahyoid dissection of neck should be carried out either six weeks after irradiation therapy, if that form of treatment is elected, or at the same time the lip lesion is excised, because it is shown in this series that 14 per cent of the primary group had positive nodes on admission, as proved by histological examination of the nodes removed, and that 16 per cent of the cases later developed positive nodes.

It would appear that we are not radical or thorough enough in our treatment of carcinoma of the lip evidenced by the fact that the most carefully followed and reported series of cases shows only a 65-75 per cent five-year survival, even though these cancers remain localized above the clavicle in most instances and are easily accessible for examination and treatment.

SUMMARY AND CONCLUSIONS

1. The most effective treatment of cancer of the lip is to eradicate all premalignant lesions, such as fissures, keratoses, papillomas, epithelial warts and leukoplakic areas

2. On admission a biopsy should be performed, with careful evaluation of the histologic grade of the tumor, its size, the length of time it has been present, the general physical condition of the patient and, most important, whether there is involvement of the lymph nodes in the drainage area.

3. Roentgen therapy is a valuable form of treatment for cancer of the lower lip under 2.5 cm. in diameter and 4 or 5 mm. in depth; if it is used on larger lesions involving the orbicularis oris muscle, there is a resultant defect which requires cosmetic repair. Roentgen therapy is of little value in the prophylaxis or treatment of the lymph-node—bearing area.

4. Epitheliomas involving less than one-third of the diameter of either lip can be removed by V-shaped surgical excision without

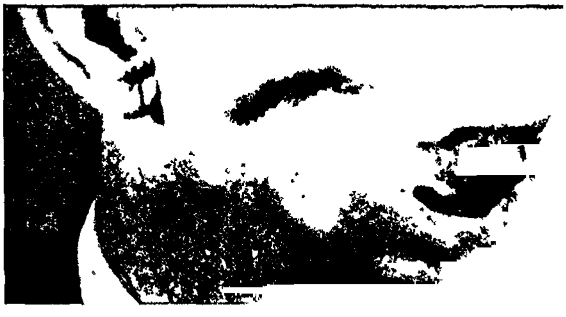

Fig. 16.—Graft placed in defect. No recurrence after six years. Rather good cosmetic result for extensive tumor.

altering the oral fissure. Larger lesions require some type of plastic reconstruction.

5 Patients who have received previous irradiation therapy require surgical excision of the tumor, as it is resistant to further irradiation

6 Surgical intervention results in a 10 to 14 per cent better five-year nonrecurrence rate than does roentgen therapy. In a group of 116 patients treated surgically there was a five-year nonrecurrence rate of 92 per cent, and in a group of 69 patients treated with irradiation the rate was 79 per cent. The overall five-year nonrecurrence rate among patients who had received no previous treatment and those who had received previous treatment was 73 per cent.

RÉSUMÉ

1. Le traitement le plus efficace pour le cancer de la lèvre est d'enlever toutes les lesions prémalignes, telles que fissures, keratoses, papilomes, verrues épitheliales et lésions leucoplasiques

2. Une biopsie faite soigneusement, le grade histologique de la tumeur, son étendue, son age, l'etat physique général du malade et, ce qui est le plus important, si les ganglions lymphatiques de la région sont attaqués.

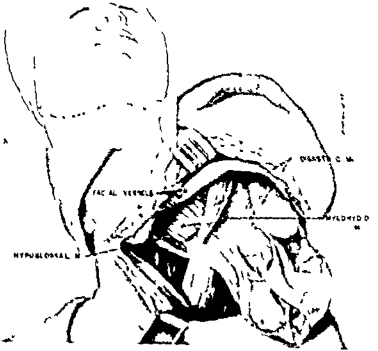

Fig. 17.—Suprahyoid block dissection of the neck for carcinoma of the lip and cheek; unilateral or bilateral as indicated. (From Ward and Hendrick, *Tumors of the Head and Neck*. Reproduced by courtesy of the Williams and Wilkins Company, Baltimore.)

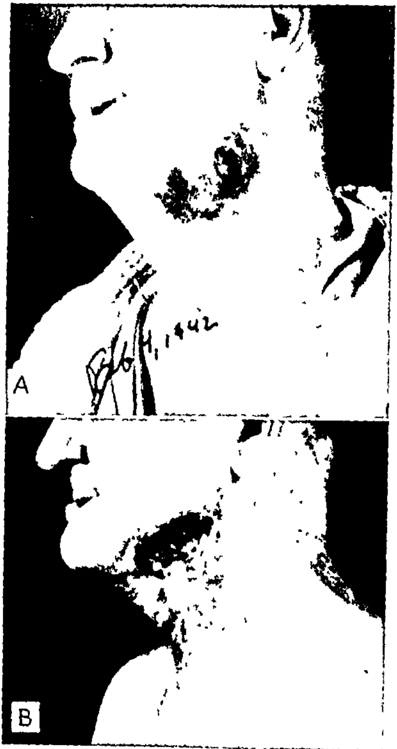

Fig 18.—*A*, patient treated elsewhere with radium for tumor on lateral third of lower lip, left side. Large necrotic lymph node developed below angle of mandible. No recurrence of lip lesion three years later. Lymph nodes curetted and treated with roentgen therapy (6,000 roentgens measured in air). *B*, result after electrosurgical removal of remaining involved lymph nodes. Radical dissection of the neck was performed, with removal of sternomastoid muscle, internal jugular vein and all lymph bearing tissue.

3. Le traitement radiologique est une forme de valeur pour le traitement du cancer de la lèvre inférieure et d'un diamètre de 2.5 Cm et de 4 ou 5 mm de profondeur. Si la lésion est plus étendue, le muscle orbiculaire ovale, il résultera un défaut qui demandera une opéra-

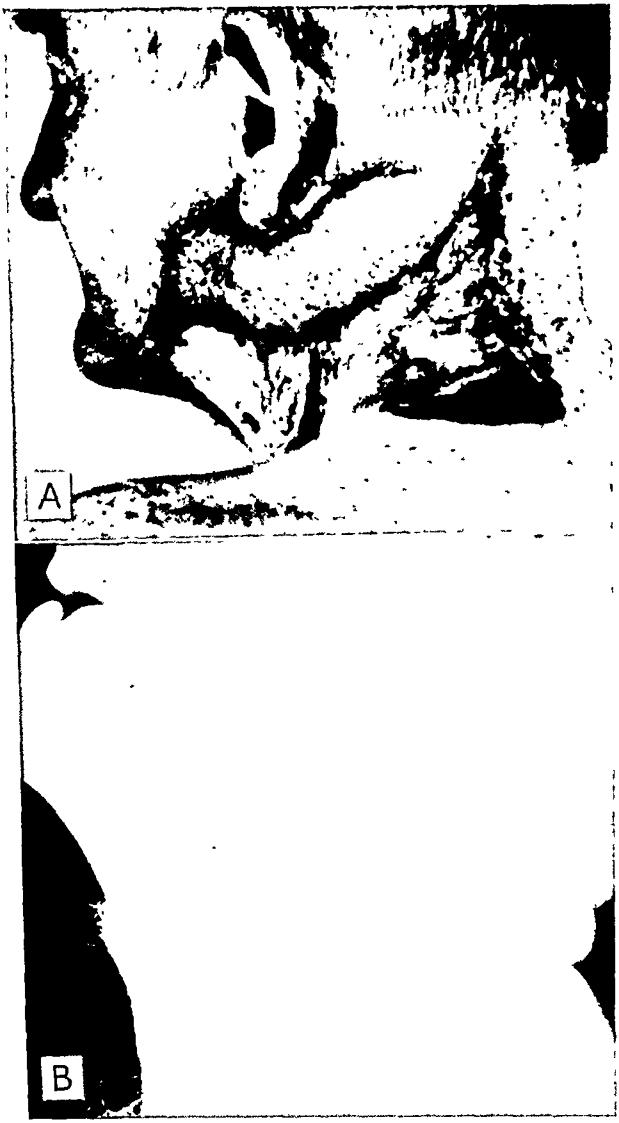

Fig. 19.—*A*, defect in lateral surface of neck after radical excision of metastatic lymph nodes. Pedicle graft brought from posterior lateral surface of neck. (To cover such a defect, including the carotid artery, the vagus nerve and other structures in the neck, requires a full-thickness graft.) *B*, cosmetic result seven years later, with no recurrence of labial tumor and no metastatic nodes in the neck. Patient refused plastic repair of lip defect.

tión plastique. Le traitement roentgenologique est de peu de valeur pour la prophylaxie ou pour le traitement des ganglions lymphatiques de la région.

4. L'épitheliome intéressant moins d'un tiers du diamètre de chaque lèvre peut être enlevé par une excision chirurgicale en forme de V- sans altération de la fissure orale. Les lésions les plus étendues exigent une reconstruction plastique.

5. Les malades qui ont été soumis à l'irradiation demandent l'excision chirurgicale de la tumeur, car elle est résistante à d'autres irradiations.

6. L'intervention chirurgicale donne des résultats de 10 a 14% meilleurs, si on considère la récidive de 5 ans que le traitement de Roentgen. Dans un groupe de 116 malades traités chirurgicalement, il n'y a pas eu de recidives dans 92% des cas, et dans un groupe de 69 malades traités par l'irradiation, il y eut une recidive dans 79% des cas. Dans les malades qui ne reçurent aucun traitement préliminaires et dans ceux qui reçurent le traitement préliminaires, il y eut une recidive de 73% des cas.

RESUMEN Y CONCLUSIONES

1. El tratamiento más efectivo del cáncer del labio es la erradicación de todas las lesiones precancerosas, como fisuras, queratosis, papilomas, verrugas epiteliales y áreas leucoplásicas.

2. Al ingreso debe efectuarse una biopsia, con evaluación cuidadosa del grado histológico del tumor, tamaño, tiempo de evolución, estado físico general del paciente y, lo que es muy importante, si existe complicación linfoglandular del área correspondiente.

3. La röntgenterapia es forma terapéutica importante para el cáncer del labio inferior menor de 2.5 cm. de diámetro y 4 o 5 cm. de profundidad, empleándose en lesiones mayores que complican el músculo orbicular de los labios, aun cuando con pérdidas tisulares resultantes que requieren reparación plástica. La röntgenterapia es de poco valor en la profilaxis o tratamiento del área linfoglandular respectiva.

4. Los epiteliomas que interesan menos de un tercio del diámetro de cada labio pueden extirparse con excisión quirúrgica en V sin alteración de la fisura oral. Lesiones mayores requieren algún tipo de reconstrucción plástica.

5. Pacientes que hayan sido irradiados previamente requieren excisión quirúrgica del tumor, dada la resistencia a mayor irradiación.

6. La intervención quirúrgica da resultados del 10 al 14 por ciento mejores que la röntgenterapia respecto a la no recidiva en 5 años. En

116 pacientes tratados quirurgicamente hubo 92 por ciento de no recidiva en 5 años En 69 pacientes irradiados el indice fué de 79 por ciento El indice total de no recidiva en 5 años para pacientes tratados y no tratados previamente fué de 73 por ciento

RIASSUNTO

1 Nel trattamento del cancro del labbro il piu efficace sia lo sradicamento di tutti lesioni pre maligni come fessure, keratosi papillome porri epitelii ed aree leucoplachie

2 Al entrata si fa la biopsia, apprezzando con attenzione il grado istologico del tumore la grandezza, la durata del tempo d'esistenza la condizione fisica generale del paziente, e piu importante complicazione di nodi linfatici dell area di scorrimento

3 Di valore e' la terapia Roentgen per cancro del labbro inferiore al di sotto di 2 5 cm in diametro e 4 o 5 mm profondo Se s'impiega nelle lesioni larghe abbracciando il muscolo oris orbicularis risultera' in un difetto che richiede riparo cosmetico Terapia con raggi X e' di poco valore nel profilassi o cura del d'appoggio di nodi linfatici

4 Epiteliomi meno che un terzo del diametro di ciascuno labbro si leva per eccizione chirurgica in forma di V senza alterazione della fessura orale Lesioni piu larghe domandano ricostruzione plastico

5 Pazienti che hanno ricevuto terapia precedente d'irradiazione richiedano eccisione chirurgica del tumore perche' porta resistenza ad altri irradiazioni

6 Intervento chirurgico risultera' in 10 a 15 per cento migliore in casi del grado non ricorrente per 5 anni che con terapia Roentgen Nel gruppo di 116 casi trattati chirurgicalmente vi era' 92 per cento del grado non ricorrente per cinque anni Nel gruppo di 69 pazienti con irradiazione il grado era 79 per cento Sopratutto il grado non ricorrente per 5 anni fra i pazienti che non hanno ricevuto trattamento precedente e quelli trattati in anticipo era 73 per cento

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1 Die wirksamste Behandlung des Lippenkrebses besteht in der Ausrottung aller praemalignen Veraenderungen wie Fissuren, Verhornungen, Papillomen, epithelialer Warzen und Leukoplakien

2 Bei der Aufnahme des Kranken sollte eine Probeexzision ausgefuehrt werden Dabei sollte der histologische Grad der Geschwulst sorgfaeltige Beruecksichtigung finden ebenso ihre Groesse, die Dauer ihres Bestehens der Allgemeinzustand des Kranken und vor allem auch die Frage, ob eine Beteiligung der regionaeren Lymphknoten vorliegt

3 Die Roentgenbestrahlung stellt eine wertvolle Behandlungsform von Unterlippenkrebsen dar, die weniger als 2 5 cm in Durchmesser und 4 oder 5 mm in der Tiefe messen Wird die Roentgenbestrahlung an groesseren Geschwuelsten, die den M orbicularis oris einbeziehen, ausgefuehrt, so entsteht ein Defekt, der kosmetische Wiederherstellung erfordert Die Roentgentherapie ist von geringem Wert in der Prophylaxe oder Behandlung der Lymphknotengebiete

4 Epitheliome, die weniger als ein Drittel des Durchmessers einer Lippe einnehmen, koennen mit keilfoermiger chirurgischer Ausschneidung entfernt werden, ohne die Mundoeffnung zu veraendern Groessere Geschwuelste erfordern eine oder die andere Form plastischer Wiederherstellung

5 Kranke, die schon frueher mit Bestrahlungen behandelt wurden, beduerfen der chirurgischen Entfernung der Geschwulst, da sie fuer weitere Bestrahlungen resistent geworden ist

6 Die chirurgische Behandlung fuehrt zu 10 bis 14 Prozent besseren Fuenfjahresheilungen als Roentgentherapie In einer Serie von hundertsechzehn chirurgisch behandelten Kranken betrug der Prozentsatz der Fuenfjahresheilungen 92, waehrend unter 69 mit Bestrahlung behandelten Kranken die Rate 79% war Der Gesamtprozentsatz der Fuenfjahresheilungen von vorbehandelten und von nicht vorbehandelten Kranken betrug 73

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Ectopic Pregnancy

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ECTOPIC pregnancy or eccyesis signifies gestation occurring outside the uterus. Although the term "extrauterine" is more commonly employed to signify this condition, the expression "ectopic" (first used in 1873 by Robert Barnes) is the broader and more widely inclusive designation.

Historical Notes.—The subject of extrauterine pregnancy is one of the most interesting in the entire realm of obstetrics and gynecology. This type of gestation is not mentioned in the extant Greek and Roman medical literature. What is believed to be the first reference to abdominal pregnancy is found in that great rabbinical treasure house, *The Talmud*. The rabbis of *The Talmud* observed a child "which emerged from the abdominal side of the mother."

The Buddhists mentioned a peculiar form of pregnancy outside the womb. According to their legend, the boy Buddha was "born through the right side or the armpit of his mother."

The first definite mention of extrauterine pregnancy was made by Albucasis in the eleventh century. Later, Rialan (1626) referred to several cases. Since then an enormous literature has accumulated.

Many of the successful cesarean sections reported in the early literature were probably crude laparotomies for the removal of secondary abdominal pregnancies.

The first operation for extrauterine pregnancy in America was recorded by John Bard of New York. He described the case in a letter dated Dec. 25, 1759. The patient recovered.

In 1883, Robert Lawson Tait became the first to operate successfully for a ruptured tubal pregnancy and to establish the operative technic for this condition. A pioneer in many phases of operative gynecology, Tait had been asked during the summer of 1881 to see a patient whose condition had been diagnosed as tubal rupture with internal hemorrhage. It was suggested frankly that he "should open the abdomen and remove the ruptured tube."

In 1883 Tait did operate on a patient with a ruptured tubal pregnancy. The patient died, and he attributed his failure to faulty technic. In his "Lectures on Ectopic Pregnancy and Pelvic Hematocele," published in 1888, he presented a simple classification of ectopic pregnancy. Tait was the first to work out the pathology and treatment of pelvic hematocele. His lectures are classic, and his views on this subject are generally accepted by the medical profession.

Types of Ectopic Pregnancy.—By definition, an ectopic pregnancy is a pregnancy located outside the normal uterine cavity. Primary ectopic pregnancies, in the order of their frequency, are as follows: tubal pregnancy, ovarian pregnancy, abdominal pregnancy and cervical pregnancy. Tubal pregnancy includes pregnancy in the ampulla, the isthmus or the interstitial portion of the tube. When nidation occurs in the ampulla, pregnancy usually terminates in tubal abortion. In the isthmus, because the muscle fibers are not well developed and because the tube is too small to permit expansion of the fetal sac, gestation usually terminates by rupture, with formation of a pelvic hematocele. Sometimes this occurs as early as the second or third week. Eccyesis in the interstitial portion occurs far less frequently than in the previously mentioned portions of the tube. Interstitial gestation is of particular interest, not only because of its relatively low incidence but because it produces certain perils and problems not encoun-

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tered with the more common forms According to Polak, interstitial gestation may terminate in one of the following ways

1 Death of the ovum
2 Expulsion of the ovum into the uterus in which case the pregnancy may terminate as an abortion or proceed and develop as an intrauterine pregnancy
3 Rupture into the peritoneal cavity, possibly with death of the mother from hemorrhage and shock
4 Rupture into the broad ligament

Ovarian pregnancy rarely occurs, however it is not as rare as was formerly believed Ovarian gestation may be the result of fertilization of an ovum which has not been extruded from the ovary after rupture of the graafian follicle, or of fertilization outside the ovary with subsequent ovarian nidation

Abdominal gestation may be either primary or secondary The primary type indicates that the initial implantation occurred in the abdominal cavity Secondary abdominal pregnancy implies reimplantation following initial nidation at some other site

Cervical eccyesis is the most rare type of ectopic pregnancy In this instance the fertilized ovum traverses the uterine cavity and enters the cervical canal instead of being implanted in the upper portion of the uterus Although there is no reason to believe that cervical mucosa possesses properties of resistance to the erosion and destruction of the trophoblasts this mucosa is not well suited to nidation

Etiologic Factors —The actual causes of ectopic pregnancy are unknown, but the following causes have been advanced, with more or less possibility, in the order named salpingitis, especially gonorrheal, pelvic adhesions, infantile tubes with imperfect development of the cilia, excessively long tubes, diverticula and accessory tubes, spasm of the tubes, muscle insufficiency and antiperistalsis, abnormal corpus luteum, endometriosis of the tubes ovary or cul de sac, increased invasiveness of trophoblasts favoring ready nidation, transmigration from one ovary to the opposite tube, defective metabolism and nutrition, and primary defect of the germ plasm (which should never be forgotten)

Incidence —Early statistics report the incidence of ectopic pregnancy as low as 1 in 20,000 DeLee reported a ratio of 1 ectopic pregnancy in 600 pregnancies Schumann reported the ratio of 1 to 303 Wynne observed eccyesis in 1 3 per cent of pregnancies at the Johns Hopkins Hospital Hanson reported a ratio of 1 in 70 Beacham and Beacham reported an incidence of 1 ectopic pregnancy in 208 deliveries

In a previous report of a two year (1945 1947) survey of 30 ectopic pregnancies in the charity service of the Jefferson Hillman Hospital, Hagood and Otts reported the incidence at 0 9 per cent of 3 315 deliveries In the Jefferson Hillman Hospital all patients who are less than five months pregnant are admitted to the gynecologic service Since the symptoms of ectopic pregnancy simulate those of other gynecologic conditions, it is well to compare these figures with the number of gynecologic admissions Over a ten year period (July 1940 to July 1950) in the Jefferson and Hillman Hospitals, there was a total of 12 579 gynecologic admissions During the same period there were 256 cases of ectopic pregnancy proved by operation, giving an incidence of 2 03 per cent

The ratio of ectopic pregnancy to normal intrauterine pregnancy is also interesting During this same ten year period there was a total of 31,006 deliveries, giving a ratio of 1 ectopic pregnancy for every 121 intrauterine pregnancies, or 0 82 per cent Only since the transfer of the Medical College of Alabama in 1945 have the patients' records been kept in such order that consistent, dependable information is available for statistical purposes Since that time there have been 137 ectopic pregnancies, an incidence of 0 75 per cent of the 18,386 obstetrical admissions and 1 82 per cent of the 7,552 gynecologic admissions In this series there was 1 death, representing a mortality rate of 0 73 per cent There was also 1 death in the first five years of this decade resulting in an overall mortality rate of 0 78 per cent for the total of 256 ectopic pregnancies in the past decade For statistical purposes, only the period from July 1, 1945 to July 1, 1950 will be used

In the series at Jefferson Hillman Hospital, it is interesting to note that 123 of 137 know-ectopic pregnancies were in the tubes. Of this number, 44 were in the left tube and 79 in the right. Five pregnancies in the left tube and 11 pregnancies in the right tube were not ruptured. One pregnancy in the group proved to be cervical. One 4 cm. fetus was an ovarian pregnancy, and there were 8 abdominal pregnancies, 4 ruptured and 4 not ruptured. Of the 6 abdominal pregnancies on which information was available, the average period of gestation was five months. The single death occurred in a case of abdominal pregnancy.

Reported Death: The single death included in this series was that of a 31-year-old Negress, a primigravida whose last menstrual period had occurred eight and one-half months prior to her admission to the hospital. Apparently she had had a normal pregnancy until that time. She was admitted to the hospital supposedly in labor and was to undergo cesarean section because of large uterine fibroids. After being in the hospital for several hours she was examined per vagina, and a mass was felt which later turned out to be the normal-sized uterus. On the operating table she was delivered of a living child of approximately eight to eight and one-half months' development; this was an abdominal pregnancy. After the delivery the placenta was found diffusely attached over the surface of the small intestine. Soon thereafter the patient began to bleed from the placental site, the placenta being left in place. She bled profusely after the operation, went into irreversible shock and died.

Age Incidence.—The 137 cases with available records, the age of patients with the number of ectopic pregnancies in that age group and the percentage in each group are as follows:

Age	*Number*	*Percentage*
16 - 20	6	4.38
21 - 25	30	21.9
26 - 30	43	31.39
31 - 35	43	31.39
36 - 40	13	9.49
41 - 45	2	1.46

The youngest patient in the series was 18 years old and the oldest 42. This table shows that at Jefferson-Hillman Hospital 63.78 per cent of all the patients, Negro and white, were between 26 and 35 years of age. There were 56 white patients and 81 Negro patients in the series, or 41 per cent white patients and 59 per cent Negro patients. Torpin, at the University of Georgia, with a series of 80 cases of ectopic pregnancy, reported a rough estimate of 60 per cent white and 40 per cent Negro patients. The incidence of ectopic pregnancies in the various age groups was essentially the same for the Negro as for the white patients admitted to this hospital. The majority of each race remained in the 26- to 35-year age group.

Status of Patients as to Pregnancies, Deliveries and Abortions.—Excluding the extrauterine gestation which causes these patients to come to the hospital, Beacham and his associates at Charity Hospital in New Orleans noted there were 62 primigravidas, 69 secundigravidas and 52 tertigravidas. They also recorded 17 septigravidas.

	Number of Previous Pregnancies		
	Beacham	*Jarcho*	*Douglas*
0	62	65	22
1	69	49	37
2	52	31	24
3		16	11
4		7	10
5		2	5
6		1	7
7	17	1	6
8		1	3
9			0
10			1
	200	173	126

Dindia and Turcotte reported a series of 90 cases of extrauterine pregnancy, in which 29, or 32 per cent, of the patients were nulligravidas and 21, or 22 per cent, were primigravidas.

Abortions in our series as compared with that of Jarcho is as follows:

Number of Abortions	*Jarcho's series*	*Douglas' series*
0	118	84
1	42	25
2	10	7
3	1	7
4	1	2
5	1	0
6		1
7		1
	173	127

Lack of information made it impossible to record the number of abortions previously experienced by these patients The foregoing distribution is based on the 127 patients on whom information was available

Pathologic Picture—Tubal pregnancy is by far the most common form of eccyesis Whether the ovum rests in the ampulla, the isthmus or the interstitial portion of the tube, the course is the same Subsequent development may pursue a course of tubal abortion, tubal rupture, death of the embryo with resultant absorption or formation of a tubal mole analogous to the bloody or fleshy mole The trophoblast produces cytolysis of the cells of the tubal mucosa, and the ovum then nestles into the muscular wall of the tube in a way similar to that of pregnancy within the uterus A full decidua is rarely formed in the involved tube, but usually one finds islands of decidua in and near the implantation of the ovum and even in the other tube The uterus usually increases in size to that of a two or three month intrauterine pregnancy, and the endometrium develops into a decidua vera through the uterine cavity As the decidua in the tube is eroded by the villi of the decidual capillaries, they penetrate many blood vessels and also penetrate between muscular fibers Conditions in the wall of the tube are so different from those in the thick decidua of the uterus that the dangers of tubal pregnancy are easily seen Indeed, in the tube the ovum acts like a rapidly growing destructive neoplasm

The ovum may be arrested between the folds of the redundant tubular mucous membrane, or it may attach itself to the top of a fold In either case the growing ovum distends the tube to the point of rupture Some hypertrophy of the tube occurs in all cases, in rare ones, the tube grows until term without rupture, these being the cases in which it has been supposed that muscle fibers could develop (at an advantageous site) Usually the hypertrophy of the muscle of the tube is insufficient to accommodate the growing egg, and the fibers at the placental site begin to be separated and destroyed by the erosive action of the villi Soon a weak spot results Any traumatism, such as may result from straining at the stool, coitus or bimanual examination may cause a slight hemorrhage and rupture, or the tube bursts from overdistention of the thin, necrotic wall, and the villi lie free in the peritoneal cavity Depending upon the point of rupture, the tube may rupture into the broad ligament, the peritoneal cavity or the lumen of the tube, forming a hematosalpinx, or possibly it may form a hematocele in the cul de sac of Douglas Rarely, lithopedion formation may occur and some months later a "foreign body" type of reaction take place

When the ectopic pregnancy first becomes disturbed by uncontrolled hemorrhage, the decidua is usually shed in small pieces or, rarely, in a complete decidual cast This is the source of the vaginal bleeding which is one of the primary symptoms of an ectopic pregnancy

Abdominal Pregnancy Although the embryo usually dies after tubal rupture and is thereafter slowly absorbed, it may live and develop for a time after tubal abortion After it succumbs it eventually becomes mummified or infiltrated with lime salts Further development of the fetus within the abdominal cavity subsequent to tubal or ovarian pregnancy is a secondary abdominal pregnancy, with the placenta maintaining its primary attachment instead of becoming detached and reimplanted in the peritoneal cavity In these cases the placental relationships are difficult to determine at operation The placenta is usually attached to the uterus or tube or spread out over the uterus and the adjacent coils of intestine

Primary abdominal pregnancy is apparently not so rare as was formerly thought Evidently the increased incidence of pelvic endometriosis has brought with it a corresponding increase in the incidence of primary pregnancy in the abdominal cavity This pathologic process is always a serious obstetrical problem Development may continue until the pregnancy is far advanced The child is usually markedly deformed

Ovarian Pregnancy Nearly 100 cases of primary or true ovarian pregnancy have been recorded in the literature, but only about 60 are authentic It would appear, however, that ovarian pregnancy is not at all rare In a considerable proportion of cases it has escaped recognition This may account for many recorded instances of [illegible] ngering hemrhage from the ovary. The belief established by Leopold that primary pregnancy results solely from fertilization of the ovum before its escape from the graafian follicle is no longer tenable. Primary ovarian pregnancy may occur after fertilization in the fallopian tube just as normal intrauterine gestation develops under the same circumstances.

Spiedelberg formulated certain criteria which are still accepted as prerequisite for a diagnosis of primary ovarian pregnancy:

1. The tube on the affected side must be intact and separate from the ovary.
2. The gestation sac must occupy the position of the ovary.
3. The sac must be connected with the uterus by the ovarian ligaments.
4. Ovarian tissue must be demonstrable on the wall of the sac.

In cases of unruptured ovarian pregnancy these criteria are superfluous. Microscopic study reveals chorionic villi and ovarian tissue. A definite decidua is lacking. Corpus luteum is usually absent, although it is present in some cases, either spread around the wall of the gestation sac or located in one part of the sac.

Clinical History.—It is not often that a physician will be blessed with a patient who walks into his office and states plainly, "I have an ectopic pregnancy on this side." On one occasion in the Jefferson-Hillman series that did happen. The reason for its happening, as may be suspected, was that this was the patient's second ectopic pregnancy.

However, other signs and symptoms certainly speak loudly in their own way to indicate the presence of ectopic pregnancy. The patient frequently is nauseated; usually she will have missed a peroid or will have had vaginal bleeding lasting only a day. This may only be called "spotting." A feeling of general malaise may be one of the symptoms; soreness of the breasts and sometimes cramplike pains may direct the patient's as well as the doctor's attention to the pelvis. If the patient consults the doctor before the tube has ruptured and he suspects an ectopic pregnancy, in doing a pelvic examination he is likely to find the involved tube soft—in fact, so soft that it is difficult to distinguish it from a portion of the pelvic bowel. It is frequently described as feeling like a sausage-shaped mass characterized by complete lack of tenderness and free mobility. Allen of the University of Illinois stated, "Always, we have taught our students that an irregular bleeding from the vagina indicated pregnancy or malignancy until proven otherwise. Placing the burden of this proof squarely on the shoulders of our house staff has made them almost too conscious of ectopic pregnancy if this be possible. The comparison in these young men as compared with those trained in the other services of a general hospital is quite striking." One point to remember is that with an ectopic pregnancy, even though some of the signs indicate intrauterine pregnancy, the symptoms will not be so severe. Before an ectopic pregnancy ruptures, a pregnancy test is indicated; for even though the pregnancy is outside the normal uterine cavity, the hormone necessary for the production of a positive result from a pregnancy test is still present. Also, the basal temperature, whether oral or rectal, will remain elevated in the case of an ectopic pregnancy just as in the case of an intrauterine pregnancy. A positive result from the pregnancy test and a negative result from a colpotomy aspiration for blood usually indicates either an intrauterine pregnancy or an unruptured ectopic pregnancy.

After the pregnancy ruptures there is an entirely different picture. Typically there is a sudden, lancinating pain in one side. Almost immediately the patient exhibits shock, with cold, clammy, sweaty skin and a very tender abdomen. The tender abdomen soon becomes extremely painful; the pain may radiate either down the leg or upward. Should blood irritate the diaphragm, it is characteristic for the pain to radiate into the shoulder. Cullen's sign of discoloration about the umbilicus is rarely seen and certainly is difficult to evaluate in the Negro. Pain in the shoulder, with or without jaundice, associated with metrorrhagia, indicates hemorrhage in the pelvis rather than stones in the gallbladder. Slight jaundice occurring in a patient suspected of eccyesis is almost pathognomonic of intra-abdominal hemorrhage. After rupture of an ectopic pregnancy the sedimentation rate is slow in contrast to that associated with an infectious process. The temperature is not usually elevated. The pulse is rapid and shallow. The blood pressure drops as hemorrhage increases, the respiratory rate increases, and the patient is in very critical condition

Signs and Symptoms—The statistics we are reporting compare favorably with statistics in the literature Signs and symptoms were observed in this order (*1*) pain, (*2*) bleeding, (*3*) fainting, (*4*) shock and (*5*) a palpable mass

Signs and Symptoms of Ectopic Pregnancy

	Pain	*Bleeding*	*Fainting*	*Shock*	*Palpable Mass*
1st	93	35	9	7	4
2d	30	56	9	0	7
3d	3	3	2	7	2

This table gives an indication of the frequency of the cardinal signs of ectopic pregnancy, particularly if ruptured The signs and symptoms were classified in the order in which they appeared rather than on the basis of severity Pain still was the first and foremost complaint Ninety three patients listed it as first, 30 patients listed it as the second most severe symptom, and 3 patients listed it as third Thirty five patients listed bleeding first, 56 listed it second and 3 listed it third Shock was the most severe symptom in 7 cases

Diagnosis—It has been said that tubal pregnancy is more often overlooked when present and more often diagnosed when not present than is any other serious pelvic lesion In doubtful cases, the majority remain doubtful until after tubal abortion or rupture Examination, with the patient under anesthesia, should precede the abdominal incision The diagnosis of ectopic pregnancy cannot be made or ruled out by any single means, it is made only after evaluation of all the available information in the case One of the most important features of all is the history The symptoms as given in the patient's own words, the physical signs, and a minimum of laboratory procedures (which sometimes add confusion to an already confused situation) all go into the making of a most important decision The tube is usually soft and may be very tender As a diagnostic test, one of the frog tests is recommended We use in our private offices the X L South African frogs Physical examination sometimes reveals a pelvic mass Usually the sedimentation rate is slow and the white blood cell count comparatively low Of the series of patients at the Jefferson Hillman Hospital, only 10 had had a pregnancy test performed before operation Seven of the determinations were positive, indicating pregnancy Of the 3 remaining cases, there was an abdominal pregnancy in 1, the fetus was dead A second determination was made on a patient in whom the tube had ruptured some time before In only 1 of the 10 determinations was the result apparently in error

A second very important procedure, in our opinion, is aspiration of the cul de sac Many of the patients in this series were private patients and were operated upon by general surgeons A total of 76 patients did not have a cul de sac aspiration Of the 52 patients who had a cul de sac aspiration, 47 results were positive By this we mean that old, dark blood was aspirated from the cul de sac This is not conclusive of a ruptured ectopic pregnancy One further characteristic of the blood is very important, and that is the fact that it does not clot Fresh blood from the pelvic veins will clot One who should aspirate a pelvic vein and fail to observe the clotting properties might be led astray Of the 5 cases in which the cul de sac aspiration gave negative results unruptured tubal pregnancies existed in 2

Another procedure in the diagnosis of ectopic pregnancy is peritoneoscopic investigation The use of this procedure has been limited but those who have used it seem to think highly of it when the results are correctly interpreted

Since the beginning of the resident training program of the Medical College of Alabama the accuracy of preoperative diagnosis has been most encouraging. Preoperative diagnosis was correct in 113 of the 137 cases of ectopic pregnancy. In 24 cases the condition was missed, giving a percentile accuracy of 82 per cent. Of the 24 ectopic pregnancies missed, not one had been investigated by a cul-de-sac aspiration. Evidently ectopic pregnancy was not considered, and hence the colpotomy was not deemed necessary. Exact percentages are not available, but the diagnosis was much more frequently missed by the visiting general staff than by the resident staff of the hospital. Delay in diagnosis and treatment may end fatally for patients with ectopic pregnancy, since it gives time for complications to set in. Frequently a patient's condition will fluctuate from the time she first has a hemorrhage to the time that she has her terminal hemorrhage; hence, delay is mentioned only to be condemned in the treatment of ectopic pregnancy.

Differential Diagnosis.—Differential diagnosis in ectopic pregnancy includes consideration of well over fifty pathologic conditions of the pelvis. As a rule, however, the following conditions are most likely to confuse the diagnosis: abortion; angular pregnancy; appendicitis; corpus luteum rupture; ovarian, endometrial, or corpus luteum cysts; fibromyoma; ruptured graafian follicle; hematosalpinx; hydrosalpinx; infected hematoma or hematocele; acute pancreatitis; complications of intrauterine gestation, and pelvic inflammatory disease. It must also be remembered that in some cases intrauterine as well as extrauterine pregnancy has been observed in some cases.

Treatment.—"Watchful waiting" in the presence of ectopic pregnancy at any stage is extremely dangerous, as the sac may rupture at any moment and the patient die of hemorrhage. Treatment for ectopic pregnancy is surgical. Operative intervention to the extent of stopping hemorrhage is indicated, and in the majority of cases it consists only of salpingectomy or unilateral salpingo-öophorectomy. The sheet anchor of treatment is supportive therapy; namely, *blood transfusion or plasma transfusion* prior to the operation and possibly autotransfusions during the operation or thereafter. Until bleeding is stopped, blood should be given continuously. Operation should be performed as soon as transfusion is available and under way. It is the opinion of many that a short period of stabilization may aid the patient more than will immediate surgical intervention; but if the patient cannot be stabilized in one or two hours, operation should be performed at once.

Operative Technic.—An abdominal incision is usually employed, though Heaney and Babcock often use the vaginal route, which in their opinion shortens hospitalization and decreases the likelihood of morbidity. For all practical purposes, however, the abdominal approach is more convenient and less hazardous. Extreme haste in the procedure is not necessary, though it certainly is not advisable to perform other operations, such as appendectomy, at this time.

Operative Picture.—The unruptured ectopic tubal pregnancy presents a problem, especially with a previously infected pelvis. In such an instance it is often difficult to determine the site of pregnancy.

In the presence of ruptured ectopic pregnancy, however, the characteristic feature is the presence of varying amounts of blood in the peritoneal cavity, much of which will be clotted, though some may not be. The rupture in the tube usually is easily located, and the bleeding stopped by ligation or suture ligature around the tube. The tube can then be removed.

Prognosis.—The prognosis of ectopic pregnancy depends greatly upon the availability of blood or plasma and the rapidity with which the patient is handled. From the hospital service at the Jefferson-Hillman Hospital, the average postoperative stay in the hospital was eight and seven-tenths days. Statistics were not available on the total number of transfusions given, but blood was available through the blood bank of the hospital and plasma through the Red Cross. One or the other or both were used as needed for every patient, almost without exception. Certainly this must be given due credit in producing the low death rate.

Statistics.—The experiences of the staff at the Jefferson-Hillman Hospital may be summarized, in the form of statistical tabulation, as follows:

1	Total ectopic pregnancies	1940 1950	256
2	Total obstetrical admissions	1940 1950	30,006
3	Ratio of ectopic pregnancies to obstetrical admissions	1940 1950	0 82—1 in 121 pregnancies
4	Total gynecologic admissions	1940 1950	12 579
5	Ratio of ectopic pregnancies to gynecologic admissions	1940 1950	2 03—1 in 49 1 gynecologic admissions
6	Total ectopic pregnancies in series	1945 1950	137
7	Total obstetrical admissions	1945 1950	18,386
8	Ratio of ectopic pregnancies to obstetrical admissions	1945 1950	0 74—1 in 134 pregnancies
9	Total gynecologic admissions	1945 1950	7,552
10	Ratio of ectopic pregnancies to gynecologic admissions	1945 50	1 81—1 in 55 gynecologic admissions
11	Total white patients—56		49 (87 5%) in 21 35 year age group
		(137)	
12	Total Negro patients—81		67 (82 7%) in 21 35 year age group

	#	0	1	2	3	4	5	6	7	8	9	10
13	Gravida	22	37	24	11	10	5	7	6	3	0	1
14	Para	35	39	19	14	7	5	5	0	1		
15	Abortions	84	25	7	7	2	0	1	1			

16 *Signs and Symptoms*

Symptoms	*Pain*	*Bleeding*	*Fainting*	*Shock*	*Mass*
Order					
1st	93	35	9	7	4
2nd	30	56	9	0	7
3rd	3	3	2	7	2

17 Cul de sac aspirations—52 (47 positive results 5 negative of which 2 were unruptured)
18 123 tubal pregnancies 79 right ovary, 68 ruptured 11 unruptured, 44 left ovary 39 ruptured, 5 unruptured
19 1 ovarian pregnancy and 1 cervical pregnancy
20 Eight abdominal pregnancies 4 ruptured, 4 unruptured
21 Average hospital stay, 8 74 days
22 137 cases 113 (82%) correct preoperative diagnoses
23 2 deaths in the entire series of 255 cases, giving a mortality rate of 0 78%
24 Whole blood and/or blood plasma administered to almost every patient when shock or vasomotor collapse was present or seemed imminent

SUMMARY AND CONCLUSIONS

1 Ectopic pregnancy, particularly of the tube, will always remain one of the most serious entities in surgical practice

2 History of a "missed period and the occurrence of low abdominal pain vaginal menstrual type spotting, fainting, shock, and a palpable mass still remain the primary diagnostic points for eccyesis

3 Ectopic pregnancy must be considered in every case of acute disease of the abdomen

4 Routine needle aspiration of the cul de sac of Douglas is strongly advised in the presence of suspected eccyesis either with or without rupture

5 Whole blood and/or plasma should be used to maintain the patient until operation can be performed

6 Surgery is *the* method of treatment of ectopic pregnancy, and "procrastination is the thief of Life" in dealing with eccyesis

RÉSUMÉ

1 La grossesse ectopique, principalement tubaire est toujours une entité chirurgicale très sérieuse

2 L'histoire d'une période menstruelle manquante et la présence de douleurs abdominales, de pertes, de taches menstruelles vaginales, de defaillance, de choc et de masse

palpable pelvienne sont d'une importance primaire pour le diagnostic.

3. La grossesse ectopique doit être considérée dans tous les cas de maladie aiguë de la partie inférieure de l'abdomen.

4. L'aspiration avec une aiguille du cul-de-sac de Douglas est fortement recommandée dans les cas douteux avec ou sans rupture.

5. La transfusion sanguine ou de plasma sera employée pour fortifier le malade jusqu'au temps opératoire.

6. La chirurgie est la méthode de traitement de grossesse ectopique et tout retard peut être mortel.

RESUMEN Y CONCLUSIONES

1. El embarazo ectópico, particularmente de la trompa, permanecerá siempre como una de las entidades más graves en la práctica quirúrgica.

2. La historia de "falta de período" y la ocurrencia de dolor abdominal bajo, pérdida vaginal de tipo menstrual, desmayo, choque y una masa palpable aun permanecen los primeros puntos de diagnóstico para ecciesis.

3. El embarazo ectópico debe considerarse en todo caso de abdomen agudo.

4. La rutinaria aspiración con aguja del fondo de saco de Douglas es muy de aconsejarse en caso de sospecharse ecciesis con o sin ruptura.

5. Deberán usarse sangre o plasma para sostener al paciente hasta que la operación pueda efectuarse.

6. La cirugía es el método terapéutico del embarazo ectópico y en tratándose de ecciesis "la tardanza es el ladrón de la vida."

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Die ektopische Schwangerschaft, besonders die Tubargraviditaet wird immer ein aeusserst ernsthafter Gegenstand der chirurgischen Praxis sein.

2. Die Anamnese einer "ausgebliebenen Periode." das Auftreten von Schmerzen im Unterbauch, menstruationsaehnliches, tropfenweises Bluten aus der Scheide, Ohnmachtsanfaelle, Schock und eine palpierbare Geschwulst bleiben die primaeren diagnostischen Anzeichen fuer extrauterine Schwangerschaft.

3. Ektopische Schwangerschaft muss in jedem Fall als eine akute Baucherkrankung aufgefasst werden.

4. Beim Verdacht auf extrauterine Schwangerschaft mit oder ohne Durchbruch wird die routinemaessige Ansaugung des Inhalts des hinteren Douglas mit einer Nadel dringend empfohlen.

5. Transfusionen von Blut oder Plasma oder beidem sollten angewandt werden, um die Patientin am Leben zu halten, bis die Operation ausgefuehrt werden kann.

6. Bei extrauteriner Schwangerschaft ist die chirurgische Behandlung *die* Behandlung, und "Verzoegerung ist ein Lebensraeuber."

RIASSUNTO

1. Gravidanza ectopia, particolarmente del tromba di Fallope, rimanerá una dei piu grave entita nella practica di chirurgia.

2. La storia d'un periodo omesso e l'accorrenza di dolore addominale basso, macchia vaginale tipo mestruale, svenimento, shock, e una massa palpabile, ancora rimangano punti cardinale nella diagnosi.

3. Dovrebbe essere considerato in tutti casi di malattia acute addominale, la diagnosi di gravidanza ectopica.

4. Aspirazione pratica del cul-de-sacco di Douglas e vigorosamente consigliato nella presenza d'un "eccysis" sospetto sia, con oppure senza rottura.

5. Sangue intatto e/od plasma s'impiega per sóstenire il paziente in anticipo del operazione.

6. Chirurgia é il metodo de trattamento. Procastinazione é ladrone della vita.

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Inguinal Hernia

A New Surgical Treatment

ANDRÉ HEFFEZ, M.D.
CAIRO, EGYPT

NOTHING is more dispiriting to a surgeon than to operate on a hernia and have it recur. Faced with the patient and his unspoken blame, the surgeon feels as guilty as though he were totally responsible for the inadequacy of the surgical procedure.

This fact is the principal basis of the present contribution. Later I intend to publish, under the title "Contribution to the Study of the Inguinal Canal," a piece of work I have perfected at the Faculty of Medicine in Cairo, where I am a co-worker of Dr. B. Boulgakow, Curator of the Museum of Anatomy.

The eclectic procedure suggested here is most radical. It is not claimed that all recurrences will be prevented. It does represent, however, an entirely new approach to the problem. Summing up the available data on surgical technics for inguinal hernia, one finds that each of the procedures hitherto used has derived some part of its technic from one or more others. I shall mention only those best known: the method of Bassini, that of Championniere, that of Forgue, that of Cannaday (who implants a cutaneous graft from which the fat has been removed) and that of Narath and Lotheissen, who stitch Cooper's ligament to the conjoined tendon.

Other known methods are variations of these technics. To find a new technic, it was necessary to make a clean sweep of all old ones.

A preliminary word about the international statistics upon which my researches are based is here in order. Leigh,[1] in a series of 2,250 inguinal hernias, encountered 286 recurrences. According to his data, direct inguinal hernia recurs in 10 to 20 per cent of cases, sometimes even from 25 to 50 per cent. External oblique inguinal hernia recurs only within the limits of 5 to 10 per cent. Sertoli,[2] reporting the figures of Ceci of Pisa in 1909, noted 2 per cent of recurrences in 1,509 cases of hernia of the groin. Fantino[3] pointed out 74 recurrences among 4,200 inguinal hernias. He noted that the recurrence rate increased with the age of the patient: 4 per cent for patients 20 to 60 years old, and 9 per cent, or more than double, for patients aged 60 and over. He made particular mention of the impressive recurrence rate of 14 per cent for direct inguinal hernia.

The statistics at this hospital (Jewish Hospital of Cairo, Department of my chief, Prof. Picard) are as follows:

1. Forty-three cases of hernia in children, with 1 recurrence, which is exceptional.
2. Five hundred and ninety-eight cases of hernia in men, with 57 recurrences.
3. Thirty cases of hernia in women, with 3 recurrences.

These figures depend on various factors: the ability of the surgeon, the cellular type of the tissue involved, the sex of the patient and, above all, the surgical technic employed. Since the introduction of this new technic most recurrences in our hospital have taken place after operation by other surgeons.

An anatomic outline is necessary as a preliminary to setting forth the technical details. If one examines a human fetus of 24 cm., one observes that the cutaneous orifice of the inguinal canal is median and vertical. In the course of development the anterior and upper iliac spine deviates from the pubis, and the false pelvis lengthens laterally after development of the iliac wing. There results a stretching of the soft parts attached to the skeleton and, in these circumstances, of the large abdominal muscles. The inguinal canal becomes oblique instead of vertical and lateral instead of median. As a result of the stretching its tissues lose their firmness and become thin and dissociated, and, especially in this region, where the inguinal canal is weak, cause predisposition to hernia.

The retroparietal peritoneum, facing the deep orifice of the inguinal canal and following the course of the cord, insinuates itself along the canal in a manner conducive to any

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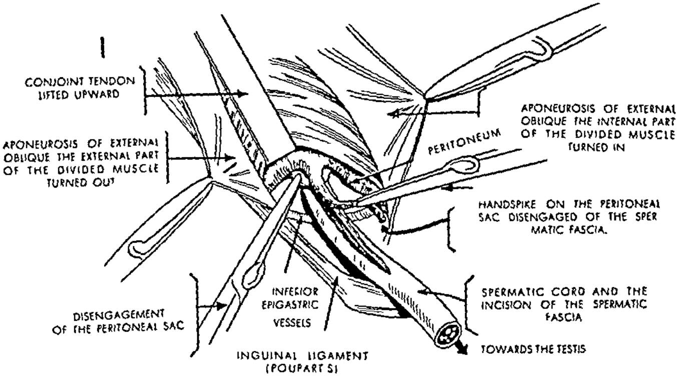
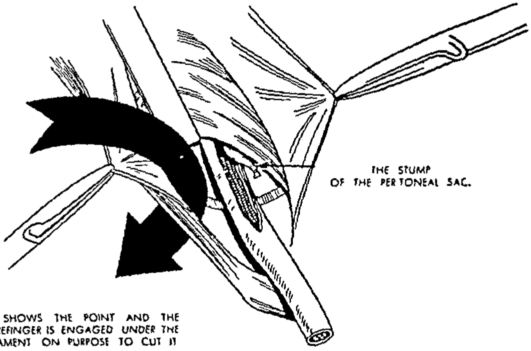
Submitted for publication Aug. 7, 1950.

1


CONJOINT TENDON LIFTED UPWARD
APONEUROSIS OF EXTERNAL OBLIQUE THE EXTERNAL PART OF THE DIVIDED MUSCLE TURNED OUT
PERITONEUM
APONEUROSIS OF EXTERNAL OBLIQUE THE INTERNAL PART OF THE DIVIDED MUSCLE TURNED IN
HANDSPIKE ON THE PERITONEAL SAC DISENGAGED OF THE SPERMATIC FASCIA
SPERMATIC CORD AND THE INCISION OF THE SPERMATIC FASCIA
INFERIOR EPIGASTRIC VESSELS
DISENGAGEMENT OF THE PERITONEAL SAC
INGUINAL LIGAMENT (POUPART S)
TOWARDS THE TESTIS

2



THE ARROW SHOWS THE POINT AND THE WAY THE FOREFINGER IS ENGAGED UNDER THE INGUINAL LIGAMENT ON PURPOSE TO CUT IT

degree of external oblique hernia The direct hernia, which inserts itself into the small cavity included between the epigastric artery on the outside and the umbilical artery on the inside, also appears at the cutaneous orifice of the inguinal canal

It is therefore logical to assume that a technic which leads to definitive removal of the inguinal canal though sparing the elements that cross it, will reduce or even ward off the chances of recurrence This precisely is the aim of the technic to be presented

Details of Surgical Procedure —This operation is performed in three separate steps

Step 1: The classic cutaneous incision is made The aponeurosis of the greater oblique muscle is flattened by cleavage along the inguinal canal The spermatic fascia is split, the separation from the hernial sac being followed upward as far as possible until the actual neck of the sac is reached (Many recurrences are due to incomplete removal of the sac) The sac is then opened to verify its contents and is closed again, after torsion, with one or two ligatures, the underlying shreds are then disposed of I have abandoned the method of

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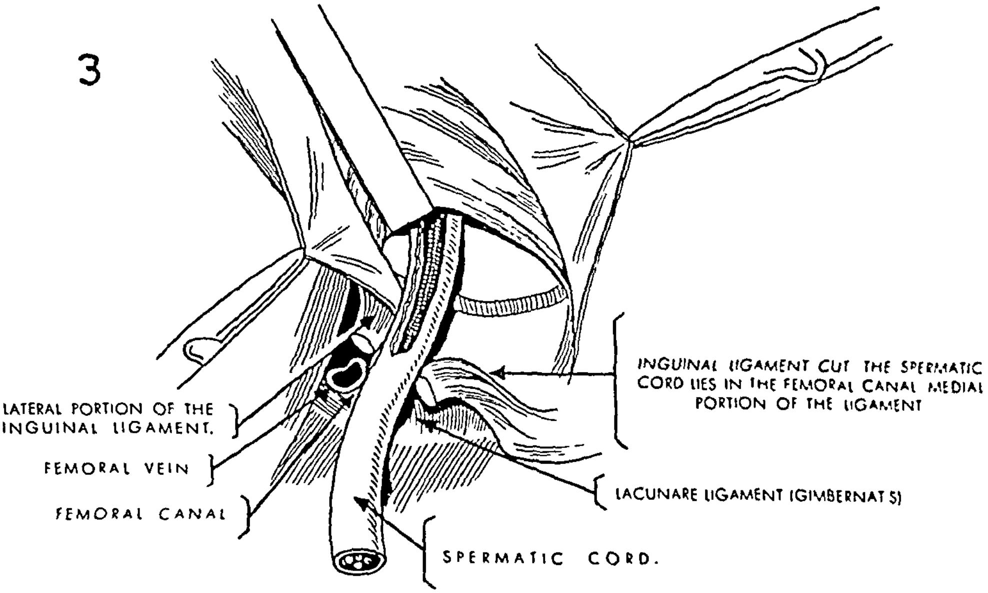
Note—The cuts to illustrate this article were made abroad and include legends.

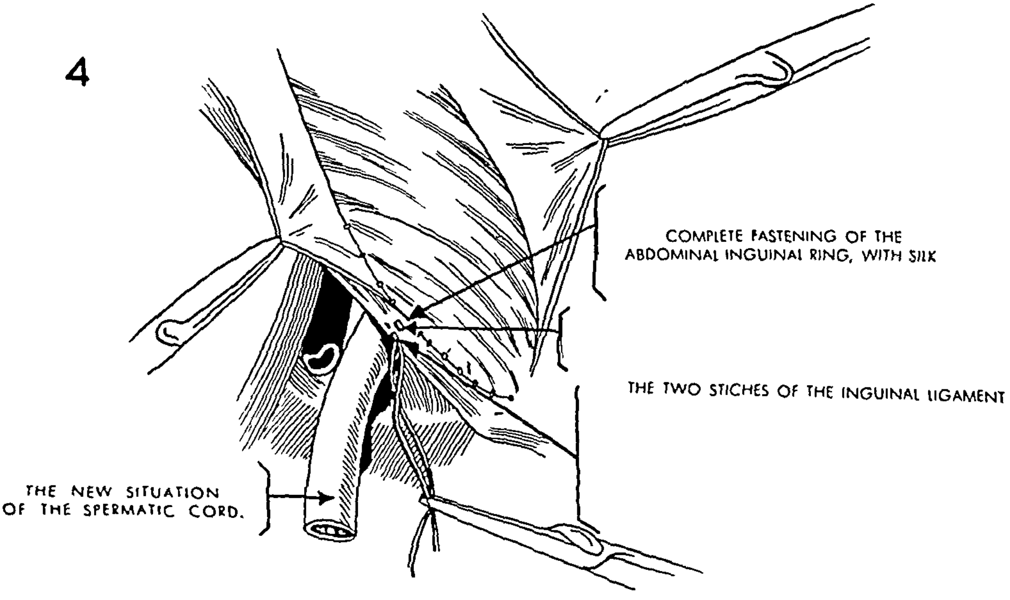
Barker, finding it dangerous; if one ties the peritoneum to the anterior muscular coating of the abdomen, the hernia may recur because of muscular dehiscence. In removing the sac, great care must be taken not to injure the epigastric pedicle, which tends toward the posterior face of the rectus muscle, inside the cord on a posterior plan. At the same time the cord is freed as far upward as possible from its links to the peritoneum, this being accomplished by means of pincers carrying a tuft of gauze. The maneuver is somewhat hemorrhagic, but the bleeding is of the parenchymatous type and not alarming. Finally, those fibers of the cremaster muscle which may still impede the lowering of the cord should be detached (Step 2, Fig. 1).

Step 2: By means of gauze mounted on pincers, the internal extremity of Poupart's ligament is liberated on its crural slope. The femoral packet is accurately located with the finger. The bent forefinger is inserted from the top downward, from the abdomen toward the thigh, under Poupart's ligament. The latter

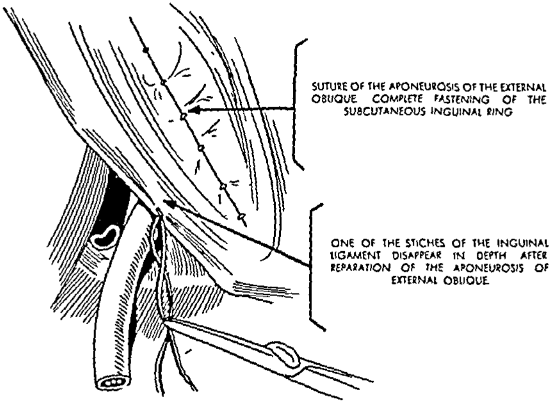
3


INGUINAL LIGAMENT CUT THE SPERMATIC CORD LIES IN THE FEMORAL CANAL MEDIAL PORTION OF THE LIGAMENT
LATERAL PORTION OF THE INGUINAL LIGAMENT.
FEMORAL VEIN
LACUNARE LIGAMENT (GIMBERNAT S)
FEMORAL CANAL
SPERMATIC CORD.

4


COMPLETE FASTENING OF THE ABDOMINAL INGUINAL RING, WITH SILK
THE TWO STICHES OF THE INGUINAL LIGAMENT
THE NEW SITUATION OF THE SPERMATIC CORD.

5


SUTURE OF THE APONEUROSIS OF THE EXTERNAL OBLIQUE COMPLETE FASTENING OF THE SUBCUTANEOUS INGUINAL RING
ONE OF THE STICHES OF THE INGUINAL LIGAMENT DISAPPEAR IN DEPTH AFTER REPARATION OF THE APONEUROSIS OF EXTERNAL OBLIQUE

is split along the ligament of Gimbernat at the level of the crural infundibulum (Figs 2 and 3) The cord is then laid down on the bed of the pectineus muscle and the lesser adductor muscle, covered by their aponeuroses. Continuity of the ligament is reestablished by two stitches of strong silk (Fig. 4). The internal fragment, as it is drawn in, may be difficult to bring into apposition with the external fragment, a firmer repair can then be assured by borrowing tissue from Gimbernat's and Cooper's ligaments

Step 3: The conjoined tendon is next joined to the inguinal ligament; the two structures are stitched together with a few interrupted silk sutures It should be borne in mind that this maneuver weakens the inguinal region; too much pulling on the conjoined tendon may open the way to direct hernia. It is therefore necessary to keep very close to the inferior edge of the conjoined tendon while suturing With the cord in its new situation, this maneuver obstructs completely the deep orifice of the inguinal canal (Fig. 4). The aponeurosis of the greater oblique muscle is then sutured and the external orifice of the inguinal canal completely closed (Fig. 5), as there is no further necessity for its existence.

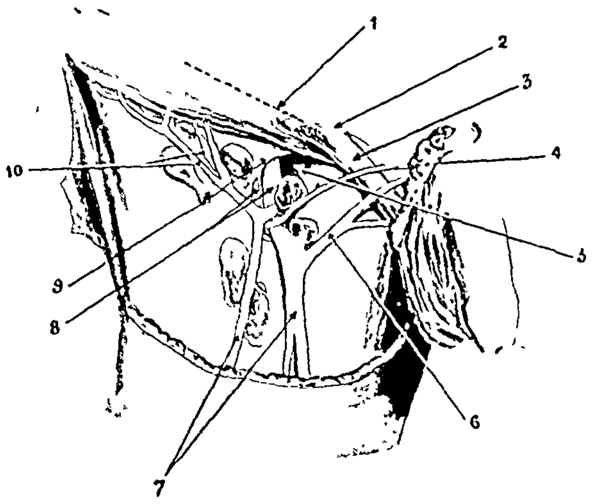
In order that this technic may be easily summarized and on the advice of [illegible] Boulgakow, I present two contrasting sketches (Figs. 6 and 7). Figure 6 shows the normal anatomy of the inguinocrural region; Figure 7, the same region after displacement of the cord.

The cord, with its contents, the arteries accompanied by their sympathetic branches, the pampiniform venous packet and the lymphatics, will adapt itself well to its new situation. The vas deferens, parallel with all these elements, wrapped up in the common sheath of the cord, itself reinforced by some still adherent fibers of the cremaster muscle, will not be exposed to trauma the [illegible] laid down in the crural infundibulum, [illegible] it is further protected by [illegible] and other structures.

On what [illegible] is radical?

In [illegible]

[illegible]



THE INGUINAL AND SUBINGUINAL REGIONS IN THE NORMAL ASPECT.

1) The usual incision of the aponeurosis of the external oblique — 2) Subcutaneous inguinal ring — 3) The spermatic cord — 4) Superficial external pudendal artery — 5) Femoral canal — 6) Superficial external pudendal vein. — 7) Great saphenous vein — 8) Femoral artery and femoral vein — 9) Superior horn of falciform margin — 10) Superficial circumflex iliac vessels

infundibulum I am only making up for that anatomic dehiscence which predisposes normally to femoral hernia and the elimination of which is a safeguard against recurrence.

In order to estimate the value of this procedure I have tried it in the most difficult cases, operating almost exclusively on old men and on patients who have had a second or a third recurrence. For example, I recently reoperated on a young man for three direct hernias which had occurred in spite of a graft from the fascia lata, applied at the time of his most recent operation (he had undergone three, in January 1946, January 1947 and December 1947 respectively). Again, I operated in the emergency case of a man aged 60 who was admitted to the hospital with a strangulated external oblique hernia after taxis had been performed to replace the herniated structures. I performed my operation, with spinal anesthesia, on the third day of his hospitalization. In this case I encountered an enormous epigastric artery, easily exceeding the caliber of a femoral artery.

I do not consider it necessary to employ this technic for children, in whom the classic procedure gives good results and is not followed by recurrence.

As yet I have not the proper perspective to draw conclusions, but I am confident that the technic is worth trying, since it gives both satisfaction to the surgeon and a sense of security to the patient.

SUMMARY

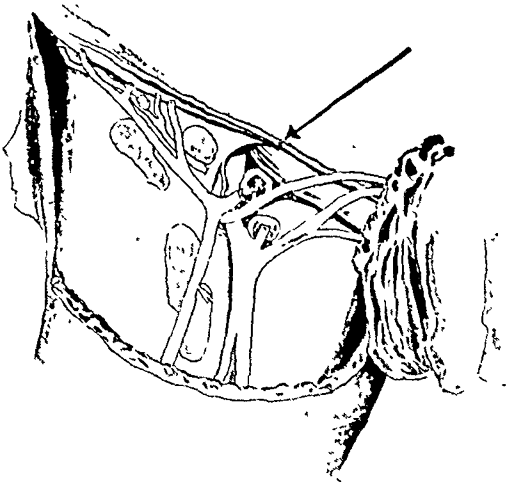
The author discusses a new procedure for surgical correction of inguinal hernia, involving elimination of the inguinal canal. He has made use of this procedure in the most difficult cases, and, although it has not been used long enough for the accumulation of conclusive statistics, he recommends it highly as presenting an advantage to both patient and surgeon.

RESUMEN

El autor discute un nuevo procedimiento para la corrección quirúrgica de la hernia inguinal. Ha hecho uso de esta técnica en los casos más difíciles y, aunque no ha sido empleado lo bastante para estadísticas concluyentes, la recomienda mucho tanto desde el punto de vista del paciente como del cirujano.

RÉSUMÉ

L'auteur discute une nouvelle procédure pour la correction chirurgicale de la hernie



THE NEW ASPECT OF THE INGUINAL AND SUBINGUINAL REGIONS

The arrow shows the point of the reparation of the inguinal ligament look after the new position of the cord inguinale Il a employé cette technique dans des cas très difficils Néanmoins, il croit qu'elle n'a pas été employée assez longtemps pour donner des statistiques conclusives L'auteur recommande cette méthode au point de vue du malade et du chirurgien

RIASSUNTO

Discute un modo di procedere novello per la correzzione di ernia inguinale Considera vantaggioso questo tecnico in casi i piu difficile, benché non sia in esistenza lungo per stastistica decisivo, l'A lo raccommanda fortemento al aspetto del paziente ed il chirurgo

ZUSAMMENFASSUNG

Der Verfasser eroertert ein neues Verfahren der chirurgischen Behandlung des Leistenbruches Er hat seine Technik in den schwierigsten Faellen ausgefuehrt Obgleich das Verfahren noch nicht lange genug angewandt worden ist, um ueberzeugende Statistiken aufweisen zu koennen, wird es doch vom Verfasser—sowohl vom Standpunkt des Kranken als des Chirurgen—sehr empfohlen

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Lag Screw Fixation of Femoral Neck Fractures

JOSEPH S. LUNDHOLM, M.D., F.A.C.S., F.I.C.S.
ROCKFORD, ILLINOIS

THE treatment of fractures in general has developed amazingly in the decade just past. It has more than kept pace with the large increase in fractures resulting from our modern way of life. Antibiotics and the application of mechanics to surgery have aided materially, and increasing knowledge of physiology has played no small part. Surgical correction and fixation have been accepted, and the results obtained have justified the acceptance. The comfort of the patient and the decreased incidence of ankylosed joints due to long periods of immobilization speak for themselves. Internal fixation, where applicable, is the nearest approach to the ideal treatment, and for fractures of the femoral neck this method enjoys wide popularity.

Surgeons are indebted to Smith-Peterson for establishing internal fixation of femoral neck fractures on a firm foundation, and also to Sven Johanson for presenting the cannulation of the three-flanged nail, which put the fixation operation within the range of every surgeon. Since then a large number of methods of fixation have been presented, and the choice lies largely in the individual surgeon's judgment, after due consideration of the physiologic advantages and disadvantages of the various methods. One must decide whether bone impaction is essential or advisable, or whether fixation without impaction is more desirable.

As is well known, in intracapsular fracture of the femoral neck nonunion may occur in spite of meticulous care and excellent treatment. In the majority of instances this is the result of destruction of or interference with the blood supply to the proximal fragment. But it is also known that in some instances, if the cardinal principles of good reduction and adequate immobilization are not fulfilled, nonunion is apt to result. Again, if an excessive number of bone cells are destroyed by impaction, nonunion is to be expected. Disruption of the blood supply is likely to occur because of the distribution of the supplying arteries, and, when the principle of impaction is employed in fixation, the physiologic factor plays an important part, because all bone cells destroyed by impaction must be absorbed.

The lag screw here presented (Fig. 1) fulfills the basic principles of surgical treatment by maintaining immobilization of the fragments without the added trauma of impaction and subsequent interference with the physiologic process of bone repair. The principle of the lag screw is not new—it has long been used in mechanical work, and its application to fracture treatment is logical and effective. The wide flange of the thread makes it possible to draw the two fractured surfaces together much more effectively and hold them in apposition much more firmly than with any other type of screw or nail. With accurate reduction of the fracture and with the lag screw holding the fragments firmly together there is no chance of rotation of the fragments, or of any angular movement. Impaction, which results in some loss of bone cells, is therefore not needed, and the result more closely approximates the ideal treatment.

The lag screw here described is so simple of construction and insertion that any surgeon can use it. It consists of one piece, complete in itself. It is constructed of nonmagnetic, nonelectrolytic molybdenum stainless steel and is supplied in varying lengths to accommodate femurs of varying size. The principle of drawing the two fragments together requires that all of the threaded portion of the screw must be contained within the proximal fragment. Careful study has revealed that the proximal fragment is never less than 1 inch (2.5 cm.) in length. Therefore the threaded portion of this lag screw is ¾ inch (1.91 cm.) in length, which suffices for all fractures of the femoral neck, regardless of the location of the line of fracture. The undersurface of the head of the lag screw is angled at 130 degrees, so that it can hold flush against the femoral shaft, and is also gnurled for the purpose of locking the lag

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screw on a bone plate when the latter is used. For intertrochanteric fractures, in which the cortex in the femoral shaft is insufficient for a firm purchase, I have devised a bone plate which can be slipped over the shaft of the lag screw and fastened to the femoral shaft; when the lag screw is then tightened down onto the bone plate, the gnurling locks the lag screw securely. The lag screw is also cannulated and is inserted over a guide pin. If the guide pin is properly placed (Fig. 2) the lag screw can be inserted over it with no fear of misdirection, and the guide pin cannot be sheared off by the lag screw. In all respects this lag screw conforms to all requirements recently laid down by the Veterans' Administration of the United States for metals to be used in the human body.

TECHNIC

The patient is brought to the operating room after the usual preoperative medication and is placed upon either a fracture table or an ordinary operating table. If the latter is used, an orderly or an assistant sits at the foot of the table and holds the foot of the fractured leg in position after reduction has been accomplished. A roentgen film casette holder is placed under the pelvis, replacing part of the mattress of the operating table. The patient is then anesthetized, and reduction of the fracture is accomplished by the Leadbetter method or any other effective maneuver A towel clip is anchored through the draping sheets and into the skin at a point midway between the symphysis pubis and the anterior superior spine of the ilium. This marks the midpoint above the head of the femur, and not only aids in the taking of anteroposterior roentgenograms but is valuable as a direction pointer during insertion of the guide pin.

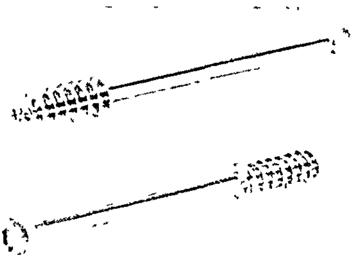

Fig 1—The Lundholm surgical lag screw

A 3-inch (7 5 cm.) incision is made in the lateral surface of the thigh, commencing about 1 inch (2.5 cm.) below the greater trochanter. The incision is carried through the fascia lata and the muscle sheath, and the muscle is separated down to the femoral shaft. A drill is then used to pierce the cortex of the femoral

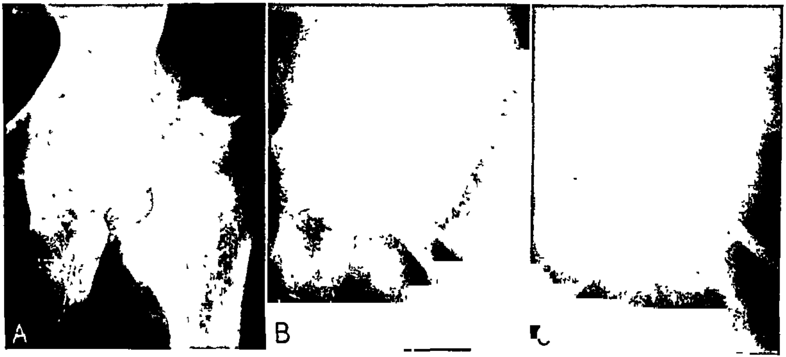

Fig. 2.—*A*, transcervical fracture. *B*, fracture reduced and guide pin in place. *C*, fracture held with lag screw in place.

shaft at the point selected, and directed towards the towel-clip marker. A guide pin is inserted through the drill hole and drilled into the proximal fragment, also directed in a line to the towel-clip marker. Roentgen films are then taken in both anteroposterior and lateral planes to ascertain whether the guide pin is accurately placed. If the placement is correct the length of lag screw needed is determined by measurement, with due consideration of the distortion caused by the focal distance of the roentgen tube from the film. The cannulated tap is then placed on the guide pin, and the thread is tapped through the cortex of the femoral shaft. The tap is withdrawn and the cannulated lag screw of proper length placed on the guide pin and screwed into position. As the lag screw passes from the cancellous bone of the femoral neck into the firmer bone structure of the femoral head near the cortex, the screw can be felt to grip into the bone, and the two fragments are felt drawing together when the screw is tightened. The guide pin is then withdrawn, roentgenograms are taken in both planes, and closure of the incision is effected in layers.

For intertrochanteric fractures, in which there is an inadequate amount of femoral shaft cortex for secure purchase, a bone plate is used to anchor the screw head to the femoral shaft, and the fracture is then held in fixation similar to that secured by a Blount blade or a Neufeld nail. The lag screw is inserted into position, the bone plate slipped onto the shaft of the screw and anchored to the femoral shaft with bone screws, and the lag screw tightened down.

The entire procedure of fixation seldom requires more than thirty or forty minutes, and the patient suffers little or no shock. The patient is returned to bed and made comfortable in any position desired. Routine care is given, and the patient is completely mobile in bed. In a day or two he is permitted to sit

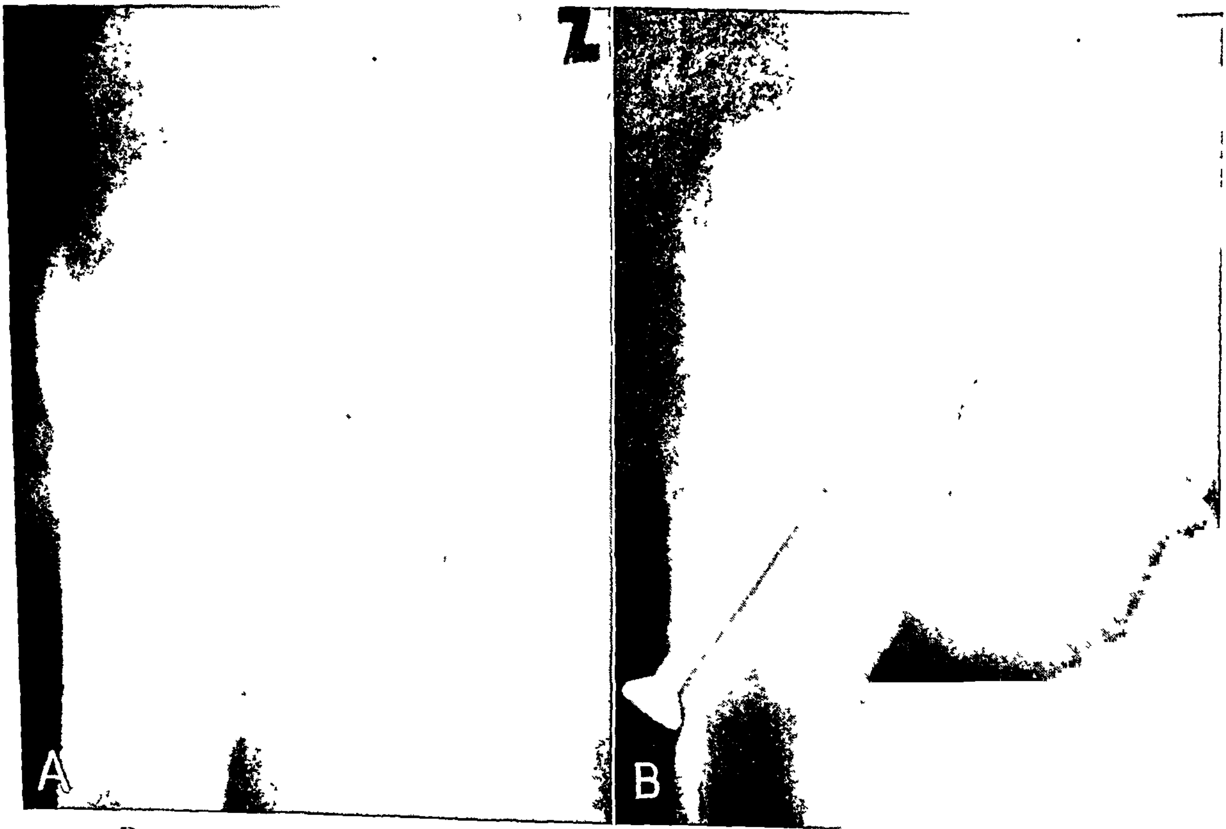

Fig. 3.—*A*, intertrochanteric fracture. *B*, fracture reduced and held with lag screw in place.

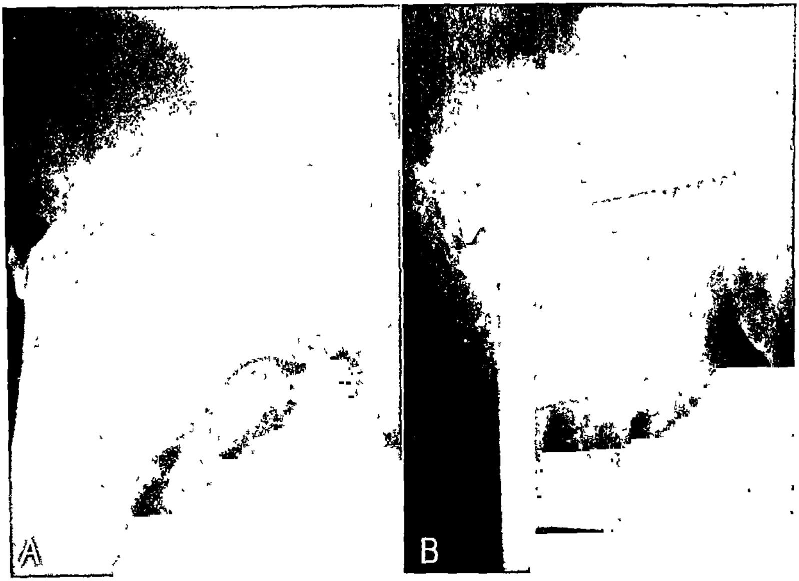

Fig 4.—*A*, *comminuted intertrochanteric fracture. B, fracture reduced and held with lag screw and bone plate.*

in a chair and to use crutches. I do not permit any weight bearing on the injured leg for three months, but the foot may be put down on the floor in walking with crutches, for the purpose of steadying the patient as he walks (Figs 3 and 4).

Compilation of results in a series of 57 consecutive cases with a minimum of one year for follow-up observation reveals some interesting statistics. There were 3 deaths, none of which were attributable to the hip fixation. One of the 3 patients who died was a white woman aged 78, who had nephritis, myocarditis and marked fibrillation on admission. She was obviously a poor risk, and I waited eight or nine days, hoping for an improvement. For a week after the fixation she was no worse; then the fibrillation became acute, anuria developed, and she died a cardiorenal death nine days after the operation. The second was a woman 75 years old, who had hypertension and diabetes mellitus. After the fixation she was permitted to be up in a chair for several weeks and seemed to be improving. Twenty-one days after the operation she went into diabetic coma and died. The third patient was a man 77 years old, who had marked hypertrophic prostatitis and nephritis on admission, and who was wearing an indwelling catheter. In this case fixation was postponed for nine days. After fixation the patient seemed comfortable and was completely mobile in bed. One week later cardiac decompensation developed, and he died a cardiorenal death.

Another interesting fact is that there were 5 cases (8 77 per cent) in which bone absorption occurred. In 3 of these cases bony union subsequently took place, with some shortening. In 2 cases (3.5 per cent) nonunion occurred; 1 of the patients had marked absorption, and a reconstruction operation was necessary. The other was an elderly woman with advanced arthritis. She refused to consider any corrective procedure and remains an invalid.

Analysis of Consecutive Cases

Total number of cases	57	
Subcapital fracture	5	(8.77%)
Transcervical fracture	27	(47.37%)
Intertrochanteric fracture	25	(43.86%)
Average number of days in hospital, all cases	21.81	
Average number of days in hospital, without complications	16	
Number of cases with absorption of neck and subsequent recovery with bony union	3	(5.27%)
Number of fractures resulting in nonunion	2	(3.50%)
Deaths from intercurrent conditions	3	(5.27%)
Deaths attributable to hip fixations	0	
Total complete recoveries	49	(85.96%)
Total recoveries with good function	52	(91.23%)

SUMMARY AND CONCLUSIONS

The simplicity of the lag screw described, the ease of insertion and the positive holding of the fragments all speak for themselves. The only special accessories needed are the bone tap and the screwdriver wrench. In fixation with this lag screw there is no loss of bone cells from impaction of the fragments, and the physiologic process of bone repair is not hindered. It is axiomatic that accurate reduction of fracture followed by immobilization without loss of bone cells is the closest approach to ideal treatment. In the author's opinion this treatment can be given by means of this lag screw with a minimum of trauma for the patient and a maximum of efficiency from the fixation splint.

RÉSUMÉ

La simplicite de la visse lagscrew est décrite ainsi que la facilité de son insertion et de sa fixation positive des fragments. Les seuls accessoires nécessaires sont un marteau et un tournevis à clef. Dans la fixation à l'aide de cette vis, il n'y a aucune perte de cellules osseuses due a l'impaction des fragments et la réparation physiologique de l'os n'est pas entravée. C'est axiomatique que la reduction de fracture suivie par l'immobilisation sans perte de cellules osseuses est le meilleur approche au traitement ïdéal. Dans l'opinion de l'auteur, l'emploi de cette vis (lag screw) entraîne un trauma minime pour le malade et un maximum d'efficacité de l'atelle fixatrice.

RIASSUNTO

La semplicita' di costruzione: la facilita' d'inserzione: la perfetta fissazione dei frammenti ossei rendono molto raccomandabile l 'uso di questo nuovo tipo di vite.

La fissazione dei frammenti evita la distruzione di cellule ossee che consequirebbe altrimenti alla pressione dei frammenti stessi, mentre non disturba il normale processo di guarigione della frattura. E' intuitivo che una riduzione accurata della frattura, seguita da un'immobilizzazione senza perdita di elementi ossei, rappresenta il metodo di cura ideale. La vite ideata dall'A. rende in molti casi quest'ideale una realta'.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Die Einfachheit der hier beschriebenen Zugschraube, die Leichtigkeit ihrer Einfuehrung und das sichere Zusammenhalten der Bruchstuecke sprechen fuer sich selbst. Alles was an besonderen Hilfsmitteln noetig ist, sind der Knochenvorbohrer und die Schraubenzieherkurbel. Bei der Bruchfixierung mit Hilfe dieser Schraube wird ein durch das Zusammenpressen von Bruchstuecken entstehender Verlust von Knochenzellen vermieden, und der physiologische Vorgang der Wiederherstellung des Knochens wird nicht behindert. Es ist ein allgemein anerkannter Grundsatz, dass die genaue Einrichtung eines Bruches mit nachfolgender Ruhigstellung ohne Knochenzellverlust einer idealen Behandlung am naechsten kommt. Der Verfasser ist der Meinung, dass

eine solche Behandlung mit Hilfe seiner Schraube unter minimaler Verletzung des *Kranken und mit maximaler Wirksamkeit der* Fixierungsschiene ausgefuehrt werden kann

RESUMEN Y CONCLUSIONES

La simplicidad del tornillo lento descrito, la facilidad de inserción y el positivo mantenimiento de los fragmentos hablan por sí mismos Los únicos accesorios especiales que se necesitan son el perforador óseo y el atornillador guia En la fijación con este tornillo lento no hay destrucción de osteoblastos por el impacto de los fragmentos y no se trastorna el proceso fisiológico de reparación ósea Es axiomático que la reducción exacta de la fractura, seguida de inmobilización sin destrucción de osteoblastos, es lo que mas se acerca al tratamiento ideal En opinión del autor, este tratamiento puede efectuarse con el tornillo lento, con trauma mínimo para el paciente y máximo de eficiencia en la fijación de los fragmentos

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A SCIENTIFIC EXHIBIT

will be held at the

Sixteenth Annual Assembly of the United States Chapter
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Palmer House, Chicago, September 11-14, 1951

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INTERNATIONAL COLLEGE OF SURGEONS
1516 Lake Shore Drive Chicago 10, Illinois

Conduction Anesthesia in Control of Obstetric Pain and in Management of Cesarean Sections

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IN the year 1901, Sicard and Cathelin of France introduced the technic of extradural nerve block for surgical and neurologic procedures, using the approach of the caudal hiatus. In the same year Kreis of Germany first used spinal anesthesia in obstetrics. In 1909, Stoeckel of Germany imperfectly applied caudal analgesia in obstetrics. These were the first attempts to relieve the pain of parturition without systemic narcosis.

For more than twenty-five years this new approach to the control of obstetric pain by obliterating it at its site of origin was neither understood nor accepted by the medical profession. It was not until 1933 that Cleland published his classic studies on the afferent neurologic anatomy of the organs of parturition, which defined the pathways of pain from the uterus as special visceral afferent paths ascending from Frankenhauser's ganglion with the sympathetics of the aortic plexus through the dorsal route of the paired eleventh and twelfth thoracic nerves to the spinal cord. This disclosure, combined with the work of Sir Henry Head, defined the sixteen nerves which transmit the pains of uterine contraction, those associated with cervical dilation and distention of the perineum. From cephalad caudal these are the four lower thoracic nerves, the six posterior routes of the sacral plexus from the second through the fourth segments, including the parasympathetic ramifications, and the paired pudendal, perineal and hemorrhoidal nerves of the sacral plexus.

With an understanding of the anatomic picture involved it is possible, by means of various technics, to eliminate pain conduction in several or all of these nerves without seriously interfering with the motor innervation of the smooth muscle fibers to the uterus, which descend in the sympathetic nervous system from segments as high as the upper thoracic and midthoracic regions.

Local perineal infiltration, pudendal nerve block and presacral nerve block are satisfactory technics to relieve perineal pain only for delivery. Paravertebral nerve block as advocated by Cleland and aortic plexus block as advocated by Aubrel are satisfactory technics to relieve the pain of uterine contraction only. Spinal, continuous spinal and saddle block spinal anesthesia, caudal and continuous caudal analgesia, and lumbar peridural and continuous lumbar peridural anesthesia are satisfactory technics to eliminate all of the pains of labor. We have used these technics since 1940, and one of us designed continuous caudal and continuous peridural anesthesia.

In the United States today there is an ever-increasing application of all these technics in obstetrics, because it is realized that with them the baby is protected from transplacental narcosis, the mother is relieved of pain, and the amount of third-stage bleeding is diminished. A great many studies now confirm the fact that there is less maternal and infant mortality and morbidity when these technics are applied under standard conditions by those skilled in their use.

Since 1942, seventy-nine physicians in the United States have managed more than a 1,000 patients each with continuous caudal analgesia. Ten clinics have managed more than 3,000 each. The Chicago Lying-In Hospital and the Lewis Memorial Hospital have utilized saddle block spinal anesthesia in more than 4,000 cases. The Baltimore City Hospitals, under the direction of Doctor Louis Douglas, have managed more than 8,000 patients by saddle block anesthesias. Lull and Ullery of the Philadelphia Lying-In Hospital have managed more than 1,200 consecutive cesarean sections with continuous spinal anesthesia and no maternal mortality.

In addition to the 2,000 deliveries analyzed

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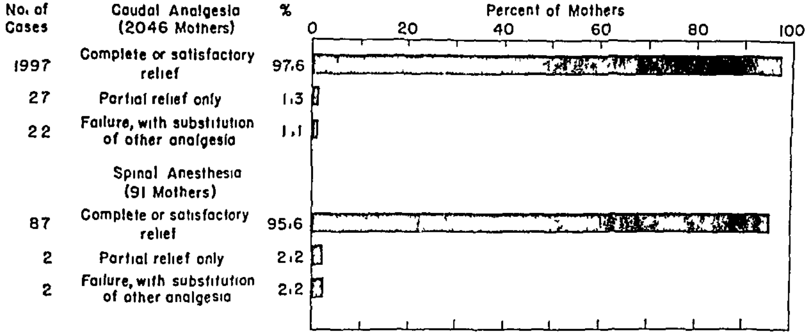


Fig 1 —Data on caudal analgesia

in this report, one of us (R A H) has man*aged 12,000 additional deliveries with these* technics in the Philadelphia Lying In Hospital, the Staten Island Marine Hospital, the John Gaston Memphis City Hospital and the Johns Hopkins University Hospital

With this wide development of conduction anesthesia methods it has been necessary to *make a complete revision of the system of hos*pital management of patients during labor and delivery This report of more than 2,000 deliveries with these technics is presented to define the teamwork necessary in the practice of obstetrics between doctors and obstetrical nurses This particular team consisted of two senior obstetricians, *two junior assistants, and* three labor nurses who were first thoroughly *trained in the principles of conduction* anesthesia and obstetrics Only the physicians initiate the nerve block anesthesia They alone decide the optimum time in labor for the induction of this type of pain relief The inductions have required an average of fifteen minutes per patient The physicians are then *relieved of the responsibility of subsequent* injections by the nurse team, which regularly checks the blood pressure, the fetal heart tones, and the levels of conduction nerve block The nurses work on a revolving schedule through the physicians' offices, which are in the same building and on the same labor *floor, in the labor rooms, and off duty* When

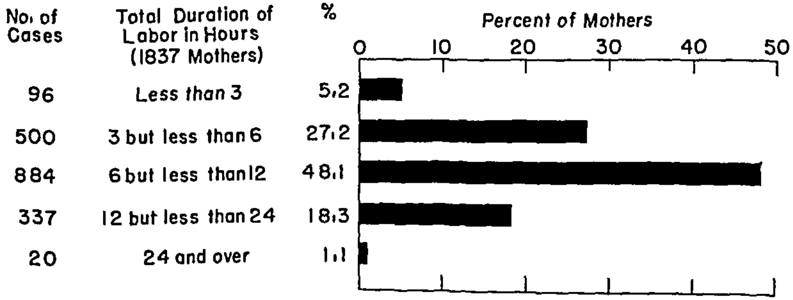


Fig 2 —Data on duration of labor

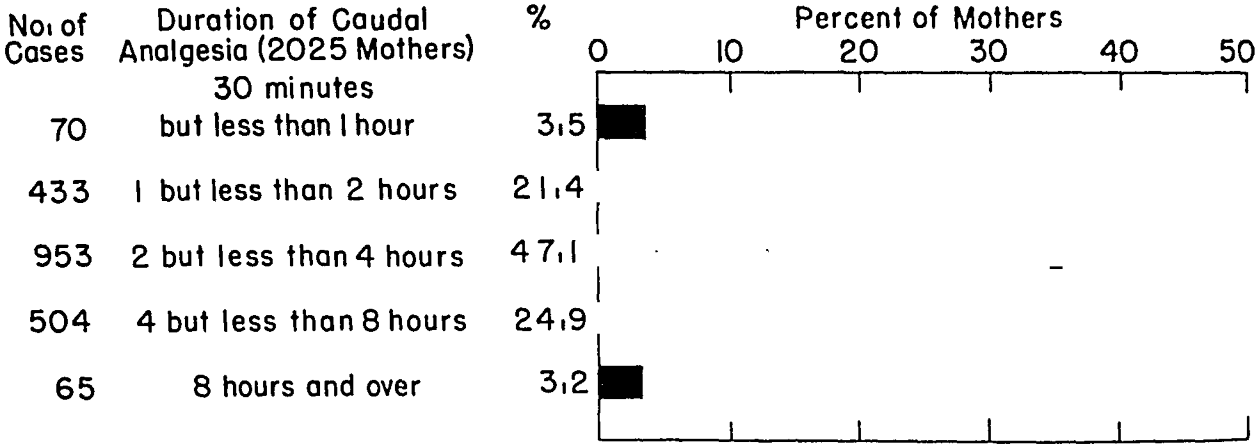


Fig. 3.—Data on duration of caudal analgesia.

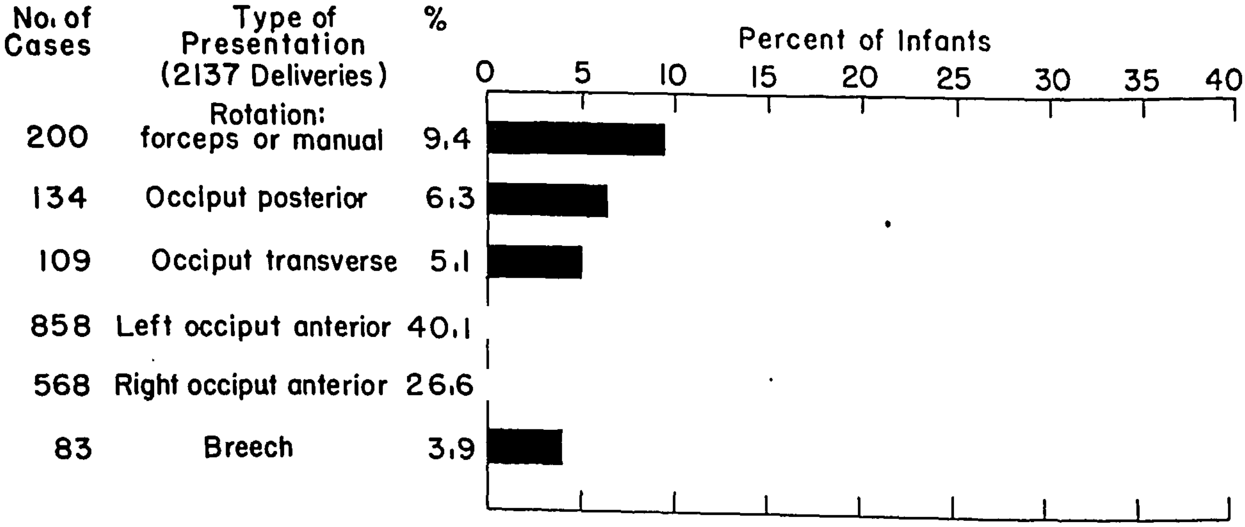


Fig. 4.—Type of presentation.

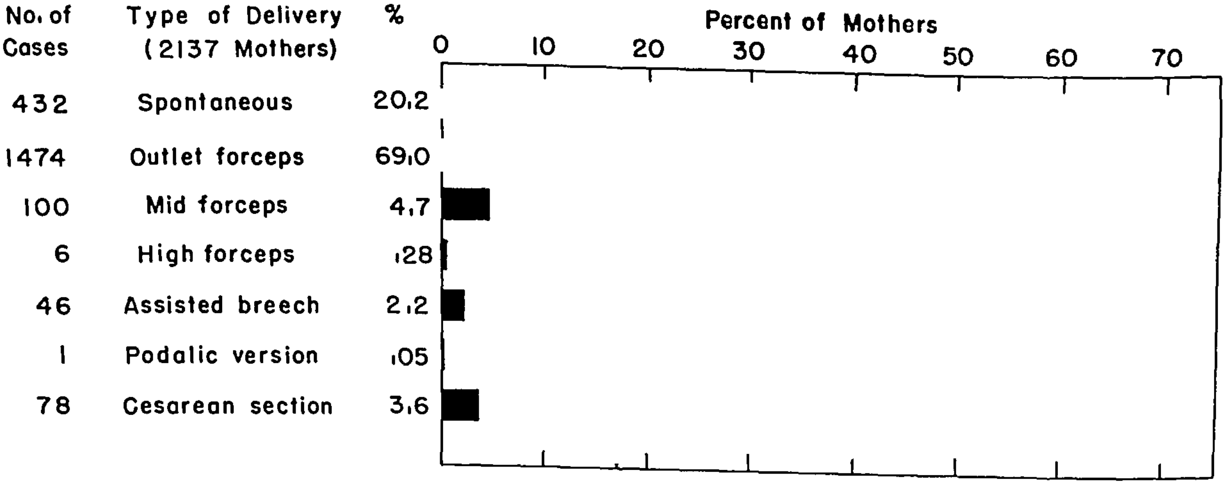


Fig. 5.—Type of delivery.

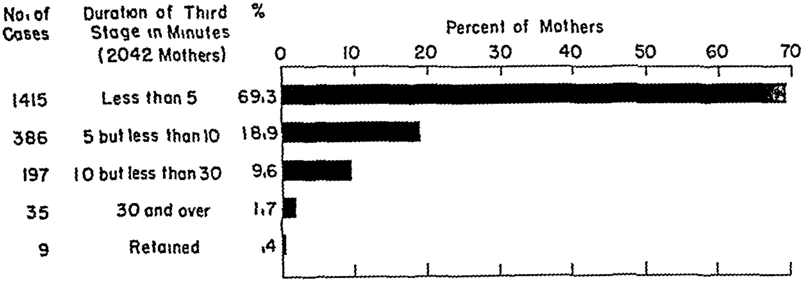


Fig 6 —Duration of third stage of labor

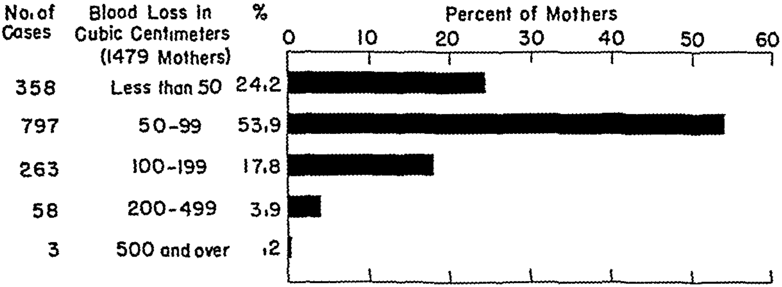


Fig 7 —Data on blood lo

there are no patients in labor the nurse either works in the doctors' office or remains on first call duty for labor at home

The senior obstetricians have office hours and are on call for delivery every other night and every other week end The junior obstetricians have the same schedule This system has worked for four consecutive years with essentially the same personnel, in such a manner that the average number of deliveries per month managed by this private service ranges from 70 to 100 The conduction nerve block technics have been used in more than 90 per cent of deliveries There has been no maternal mortality The uncorrected infant mortality of 1 9 per cent is approaching the irreducible minimum This compares quite favorably with the infant mortality during the same period at the Methodist Hospital, where this entire series was handled

In addition to checking the progress and maintaining the comfort of mothers in labor the nurses maintain at all times sterile conduction anesthesia equipment, individually packaged and stored in bedside cabinets beside each labor bed Nearly all of these labors have been conducted in the common hospital labor room containing 5 beds Simultaneously, other private patients and service patients are in labor in the same rooms under management with sedation and conduction nerve block technics The use of these technics has facilitated and made more pleasant, for both physicians and nurses the management of this large series of cases

Early ambulation has been practiced in most

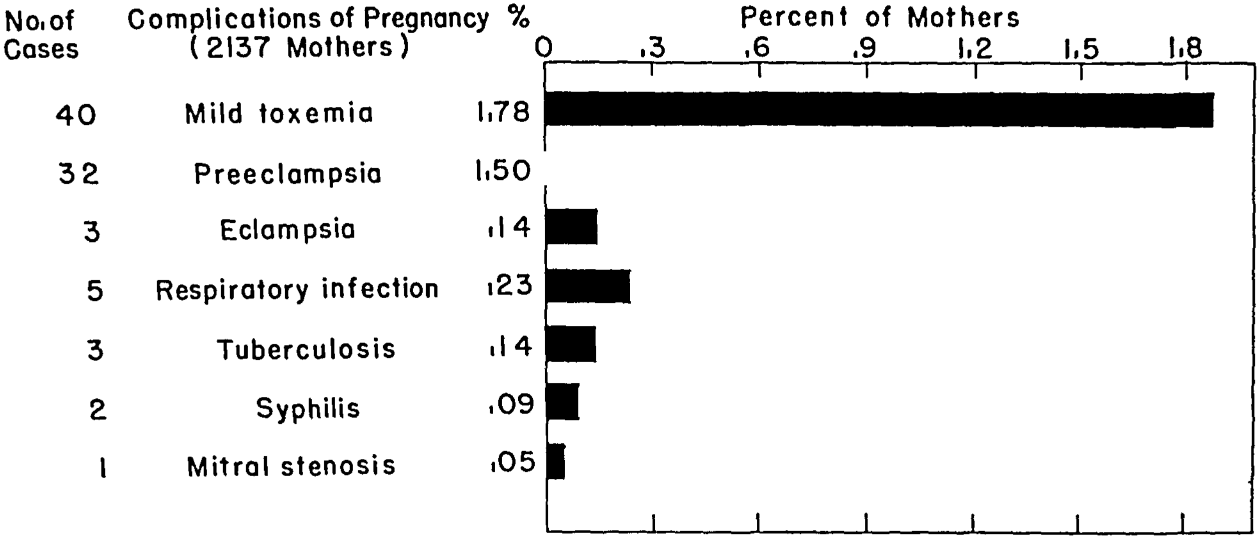


Fig. 8.—Complications of pregnancy.

of the series. Patients are permitted to sit up on the first day after delivery and to become ambulatory as desired from the second to the fourth day.

The most frequent complication encountered during labor in this series was the hypotension resulting from vasomotor conduction block. The use of vasopressor drugs, intravenous fluids, and autotransfusion by elevating the lower extremities at right angles to the long body axis have been sufficient to effect prompt restoration of the normal blood pressure. Available oxygen at the bedside is used to control nausea, which is sometimes encountered in labor and associated with conduction anesthesia. There have been no serious infections There has been only one broken needle which is still *in situ* two years after delivery. It has produced no subjective or objective symptoms.

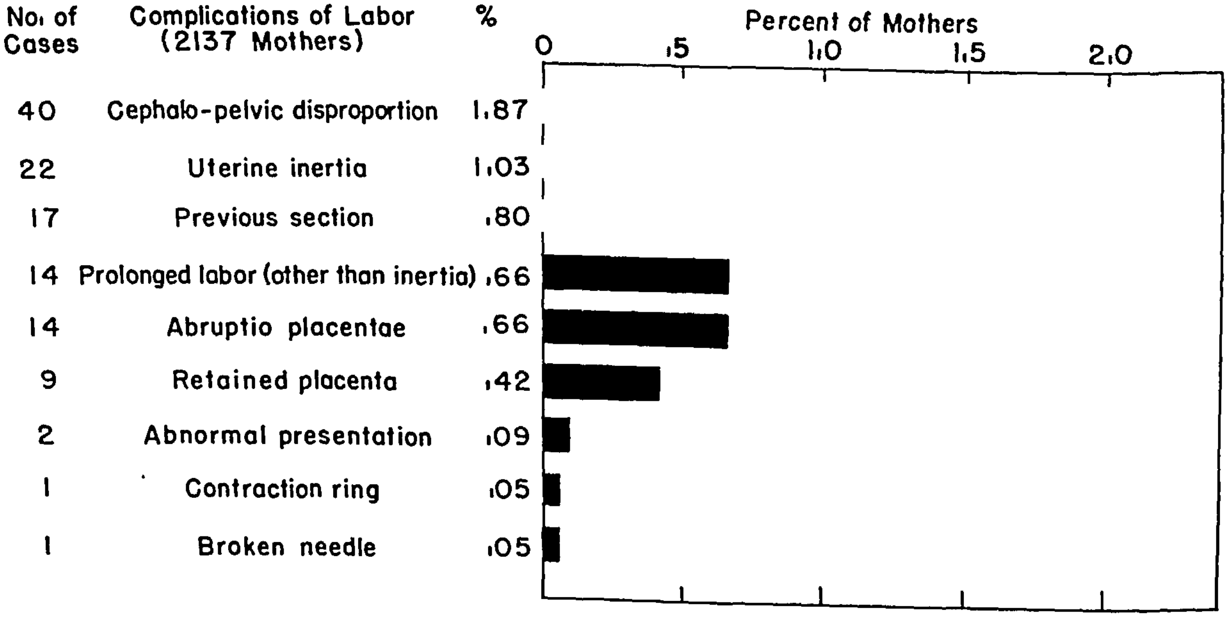


Fig. 9.—Complications of labor.

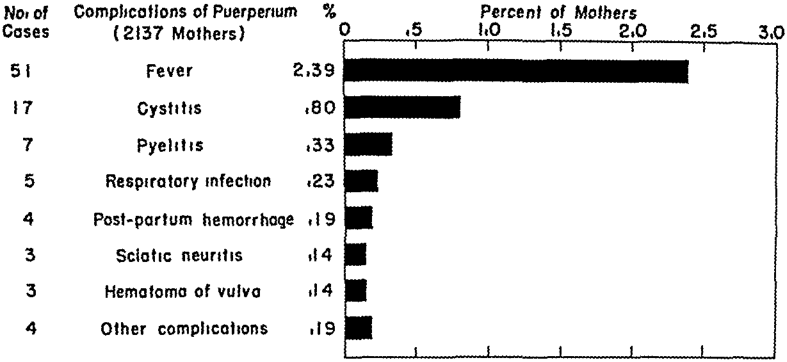
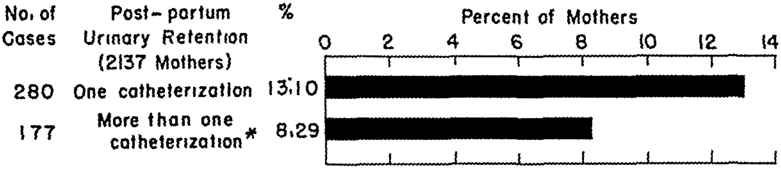


Fig 10—Complications of puerperium



** Includes 7 cases (0.33%) with "urinary retention", unqualified.*

Fig 11—Postpartum retention of urine

SUMMARY

The authors' experience emphasizes and confirms the reported successful use of conduction anesthesia in obstetrics throughout the United States. In their opinion, if these methods are correctly used there will be a reduction of infant and maternal mortality and morbidity, an expanding practice on the basis of satisfied patients and an orderly schedule and well planned routine for the obstetrical team.

RÉSUMÉ

L'experience de l'auteur lui permet de confirmer les rapports satisfaisants de l'emploi de l'anesthesie conductrice en obstetrique. Il est de l'opinion que si cette methode est employee sagement, il y aura une réduction de mortalite et de morbidite de l'enfant et de la mere. Si la technique devient plus populaire, les malades seront plus satisfaits.

ZUSAMMENFASSUNG

Die Erfahrungen der Verfasser bestaetigen und bekraeftigen die Berichte von der erfolgreichen Anwendung der Leitungsanaesthesie in der Geburtsheilkunde ueberall in den Vereinigten Staaten und unterstuetzen ihre Ansicht, dass, wenn die Methoden richtig angewandt werden, eine Herabsetzung der Sterblichkeit und Morbiditaet der Saeuglinge und der Muetter erfolgen, die Praxis auf der Basis zufriedener Patienten sich ausbreiten und ein ordentliches Arbeitsschema und ein gutgeplantes Vo[illegible]ehen der geburtshilflichen Arbeitsg[illegible]etzen wird.

RESUMEN

El autor señala y confirma el uso satisfactorio de la anestesia obstétrica en los Estados Unidos, ratificando su opinión de que, si los métodos son empleados correctamente, se obtendrá una reducción de la mortalidad y la morbilidad infantiles y maternas, expansión de la práctica sobre la base de pacientes satisfechas y una disposición ordenada y rutina bien trazada para el personal obstétrico.

RIASSUNTO

L' esperienza del 'A accentuà e conferma il successo di questo tipo d' anestesia impiegato nell' ostetrica dappertutto gli S.U. Confirmando loro opinione che risulterà in riduzione di mortalitá e morbiditá maternale e infantile.

La pratica spande su la base di pazienti soddisfatti ed inventorio regalato al corpo ostetrico.

Science and Religion

I see the human race engaged in the tremendous experiment of living on the planet called earth. From the point of view of humanity as a whole, the great aim of this experiment must be to make life more truly and more fully worth living: the religious man might prefer to say that the aim was to realize the kingdom of God upon earth, but that is only another way of saying the same thing.

The scientific spirit and the religious spirit both have their parts to play in this experiment. If religion will but abandon its claims to fixity and certitude (as many liberal churchmen are already doing), then it can see in the pursuit of truth something essentially sacred, and science itself will come to have its religious aspect. If science will remember that it, as science, can lay no claim to set up values, it will allow due weight to the religious spirit.

At the moment, however, a radical difference of outlook obtains as between change in science and change in religion. An alteration in scientific outlook—for instance the supersession of pure Newtonian mechanics by relativity—is generally looked on as a victory for science; but an alteration in religious outlook—for instance, the abandonment of belief in the literal truth of the account of creation in Genesis—is usually looked on as in some way a defeat for religion. Yet, either both are defeats or both are victories—not for particular activities such as religion or science, but for the spirit of man. In the past, religion has usually been slowly or grudgingly forced to admit new scientific ideas; if it will but accept the most vivifying of all the scientific ideas of the past century,—that of the capacity of life, including human life and institutions, including religion itself, for progressive development,—the conflict between science and religion will be over, and both can join hands in advancing the great experiment of man, of ensuring that men shall have life and have it more abundantly.

—*Julian Huxley*

Vaginal Hysterectomy in the Aged

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BROWNWOOD, TEXAS

A SEARCH of the literature reveals frequent mention of the fact that as a man ages his endoabdominal fascia tends to stretch, rendering him increasingly liable to hernia Less frequent mention is made of the fact that this occurs also in aging women, usually as a result of some relaxation of the birth canal Some authorities have stated that one in every three to five men beyond the age of 55 has some form of hernia The same can be said of aging women, and the percentage is probably even greater

The physiologic process of gestation and labor not only increases the probability of stretch of the endoabdominal fascia but is the cause of most hernias of the birth canal The 65 year old woman with a prolapse has usually had a large family without benefit of modern obstetric procedures Modern anesthesia and analgesia were not available to her Episiotomy was an unknown procedure Repair was seldom done It would be interesting to know how many young mothers of the present day will have large rectoceles or cystoceles or complete propalse at the age of 65 Very few, probably, as families are smaller and obstetric technic is greatly improved

There remains, however, the need of effective procedures to relieve older women of such conditions as those aforementioned Available procedures may be summed up as follows

1 The La Fort procedure This operation was useful in earlier days, when the risk of any other vaginal operation was unnecessary Today it carries more risk than does vaginal hysterectomy

2 The Watkins Wertheim interposition operation This has been widely used, but of late years it has been restricted to removal of the uterus There are many reasons, which need not here be discussed, why it should not be used in the treatment of an elderly woman

3 The Manchester operation This also has no place in the treatment of the elderly, though for younger women it probably has its uses

Nonoperative procedures such as the use of a doughnut pessary or a McIntosh support

5 Vaginal hysterectomy This procedure which offers the lowest morbidity and mortality rates, will be discussed as the procedure of choice

Advantages of Vaginal Hysterectomy—Of vaginal hysterectomy Potter has written "As my experience increases I am convinced that there is no other operation in gynecology that compares with its results" The advantages may be briefly listed here

1 For all practical purposes the operation is extraperitoneal

2 There is no abdominal incision, therefore no danger of hernia or wound infection is encountered, and gas pains are less likely to occur

3 Other complications, such as pulmonary emboli and thrombophlebitis, are also unlikely, and the likelihood of pneumonia or atelectasis is lessened

4 In a large percentage of cases a cystocele, a rectocele or urinary incontinence must be corrected, this correction can be combined with the hysterectomy and performed at one sitting

5 The patient's stay in the hospital is shortened

6 The patient, who is always a poor surgical risk, can undergo this operation with safety

7 Postoperative discomfort is at a minimum Most complaints are referable to the bladder or the rectum, postoperative backache is infrequent

Historical Data—Danforth has given a rather comprehensive history of the vaginal approach Allowing for the possibility that it may have been performed in ancient civilizations, the first vaginal hysterectomy was performed by Paré in 1593, for prolapse In his dissection and removal of the protruding tissues he inadvertently removed the uterus The patient survived Chenk (1600) [illegible] unter of Scotland, Clark of D [illegible] n [illegible] nbeck

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(1842) also performed successful operations. Many instances were reported between 1850 and 1882. The earliest American contribution was that of Samuel Chapin of Baton Rouge, Louisiana, in 1861[1]; his original report did not appear until 1867. In the early 1900's the abdominal route was preferred because it afforded opportunity for exploration and for removal of the appendix; the vaginal approach fell into some disrepute. Today, since it is known that there is no such thing as a "chronic appendix," all such meddlesome procedures are considered dangerous, and even if hysterectomy is done by the abdominal route the appendix is left alone unless it is diseased.[2] Hysterectomy by the vaginal route, however, is now established as a sound surgical procedure. Such men as Babcock, Tyronne, Heaney, and Kennedy have long maintained that it should be employed, whenever possible, in preference to the abdominal operation.

Indications.—The indications for vaginal hysterectomy are as follows:

1. Prolapse, either partial or complete.
2. Uterine bleeding (a frequent occurrence in the elderly).
3. Chronic cervicitis. (This is a very important indication. The cervix may have been extravaginal for years, and in many cases there are large ulcers. Even though there has been no bleeding in all this time, at the first show of blood the patient is alarmed.[1])

Technic.—In the United States, technic falls into two categories: operation with the use of clamps and operation without clamping. The Mayo technic, which involves the use of clamps to some extent but also requires replacement of the ligaments underneath the bladder to supply a pelvic floor, apparently is not used as widely as the method advocated by Heaney, which calls for preliminary clamping of the ligaments and vessels, immediate replacement of the clamp with a suture ligature and complete closure of the vaginal vault. The latter method produces less operative bleeding, and there is less chance of postoperative hemorrhage due to the slipping of ligatures. In addition, the immediate replacement of the clamp permits operation in a smaller field. A partial modification of this procedure has been used in my technic throughout, although during the war there was a period in which Heaney clamps could not be obtained; during this period the Mayo modification was used. With the Heaney clamp, vaginal hysterectomy can be performed with the greatest ease.

In detail, the technic of the operation is usually as follows: On the evening before it is to be performed, the patient is given a cleansing enema, after which sulfasuccidine or sulfaguanidine is instilled into the vagina, or the protruding parts are sprinkled with the drug. (In my experience this measure has aided considerably in lessening the probability of infection.) This completes the preparation of the cervix.

Types of anesthesia used are pudendal block, local infiltration, spinal anesthesia, sad-

Summary Record of 218 Vaginal Hysterectomies

Ages	Cases	Complications				
		Bladder	Rectum	Pelvic Abscess	Phlebitis	Death
60-65	102	0	1	1	1	0
65-70	52	2	0	0	0	0
70-75	36	0	0	1	0	0
75-80	22	0	0	1	0	0
Over 80	6	0	0	0	0	0
Total	218	2	1	3	1	0

dle block, inhalation anesthesia and intravenous anesthesia In the series reported, the technic most frequently used was saddle block, which proved to offer the best relaxation with the highest degree of safety

After the patient has been anesthetized and placed in the lithotomy position, the parts are scrubbed thoroughly with gauze, then dried and painted with tincture of merthiolate The patient is draped, and every precaution is taken to insure asepsis The cervical canal is closed by means of two Schroeder tenaculums and the part is pulled down Complete circumcision of the cervix is then done, the vesicocervical ligaments are pushed off the cervix, and the bladder is elevated The posterior sac is pushed back and the cul de sac entered A pack is placed in the cul de sac pushing all the intestinal contents upward, then clamps are placed on each Machenrodt ligament The suture ligature is applied The clamps are removed and the suture left long

Next, a clamp is placed on the broad ligament where the uterine artery is easily exposed, and another suture ligature is applied The vessel is cut and the ligature cut short After this has been done on each side there remains only a portion of the broad ligament, the round ligament and the tube This is clamped, a suture ligature is placed and cut, the suture being left long

The uterus is then removed and repair is started For this I use a modified Heaney technic The first suture is passed through the right edge of the anterior vaginal cuff, it takes a superficial bite or two in the denuded bladder, then picks up the anterior fold of the peritoneum about one third of the distance from the lateral aspect The peritoneum is included in other stitching down to the round ligaments and the ovarian pedicle The suture is continued to include successively the stump of the uterine vessel, the sacrouterine ligament and the fold of peritoneum, after which it proceeds through the vaginal mucosa This single suture, when pulled together, serves not only to close part of the vaginal vault but to improve hemostasis

Similar stitching is done on the opposite side, and the peritoneum after a thorough cleansing and sprinkling with a mixture of sulfanilamide and sulfathiazole, is closed with interrupted stitches

If there is a cystocele to be repaired, this is done next before the lateral sutures are tied, as there is some difficulty in picking up the peritoneal flap The repair completed, the vaginal cuff is closed with interrupted silk sutures (This is a very important item Until I began the use of silk approximately 1 of every 10 patients had considerable bleeding until about the tenth or twelfth postoperative day, since silk has been used, not one such instance has occurred This suture is removed in the office six weeks to two months after the operation) When the stitches have been placed, the two large sutures one on each side, are tied The closed edges of the cuff can be seen to have been pulled high into the vaginal vault The tying of these sutures is followed by the posterior repair

Postoperative Care—One small pack is placed in the vagina, to be removed after about twenty four hours The patient is instructed to get out of bed and use the combinette on her first inclination to urinate which occurs as a rule after eight or ten hours Most patients are unable to void on the first trial and require catheterization I use an indwelling catheter very seldom In this series only 1 patient required it, and in her case there was injury to the bladder

It is a standing rule that, when a patient is catheterized for the first time 5 cc of 2 per cent mercurochrome is instilled and left in the bladder Few patients require catheterization after this procedure Occasionally there is some irritation from the mercurochrome, but it is far less than that resulting from repeated catheterizations or the use of an indwelling catheter In this series there were no residual symptoms after ten days, and in all but 3 cases the patient was able to void after the first catheterization

My patients are allowed to be up after recovering from anesthesia They are on their feet and walking as early as eight hours after the operation Some have been invalids or semi invalids for years because of the prolapsed uterus presenting between their thighs, and their delight at being rid of it has no bounds The perineum is cleaned and sprinkled one of the sulfonamides. The first bowel evacuation takes place about the third postoperative day (an enema may be given if required) and as a rule there is little need of special care of the perineum thereafter.

SUMMARY

Two hundred and eighteen cases of vaginal hysterectomy are reviewed; 212 of the patients were over 60 years of age, and 6 were over 80. There were no deaths. Complications were minimal. The pelvic abscesses drained through the vagina. Carcinomas were observed at biopsy in 7 cases. Injury to both bladder and rectum, where it existed, was repaired at the time of hysterectomy. No fistulas resulted.

In the author's opinion, vaginal hysterectomy in the aged carries little, if any, morbidity or mortality. It is total hysterectomy and prevents the subsequent development of carcinoma. It may be performed with only moderate anesthesia, and the patients are up early. Pulmonary complications are lessened and operating time considerably shortened.

RÉSUMÉ

218 cas d'hystérectomie vaginale sont passés en revue; dans 212 de ces cas, le malade avait plus de 60 ans, dans 6 plus de 80 ans. Il n'y eut aucune mortalité et les complications furent minimes.

Les abcès pelviens furentdrainés par la voie vaginale. Dans 7 cas le carcinome fut observé à la biopsie. Les lésions du rectum et de la vessie urinaire furent reconnues et réparées en même temps que l'opération.

L'hystérectomie vâginale chez les personnes agées entraîne peu et même point de mortalité ou de morbidité. C'est toujours une hystérectomie totale et cela elimine le développement subsequent du carcinome. L'opération peut se faire sous anésthésie légère; le malade devient ambulant plus tôt que les jeunes femmes; les complications pulmonaires sont rares et la durée de l'opération est considérablement abrégée.

ZUSAMMENFASSUNG

Zweihundertundachtzehn Faelle von vaginaler Hysterektomie werden kritisch besprochen. Zweihundertundzwoelf davon waren ueber sechzig und sechs ueber achtzig Jahre alt. Todesfaelle kamen nich vor, und die Zahl der Komplikationen war aeusserst gering.

Beckenabszesse entleerten sich durch die Scheide. In sieben Faellen wurde bei der Probeexision Krebs festgestellt. Verletzungen des Mastdarms sowohl als auch der Blase wurden erkannt und im Zuge der Operation repariert.

Die an aelteren Kranken vorgenommene vaginale Hysterektomie hat—wenn uberhaupt—eine nur geringe Morbiditaet und Mortalitaet aufzuweisen. Die Enfernung der Gebaermutter ist immer eine vollstaendige, und dadurch wird der spaeteren Entwicklung eines Krebses vorgebeugt. Die Operation kann unter maessiger Betaeubung ausgefuehrt werden. Die Kranken verlassen das Bett frueher als juengere Frauen. Lungenkomplikationen sind seltener und die Dauer der Operation wird erheblich abgekuerzt.

RIASSUNTO

L'A. passa in rassegna 218 interventi vaginale, di cui 212 in donne oltre 60 anni di eta', 6 oltre gli 80. Le complicazioni postoperatorie sono state minime, mentre non e' stato lamentato alcun esito letale.

Gli ascessi pelvici sono stati drenati attraverso la vagina. Le lesioni rettali e vescicali sono state riconosciute e riparate al momento dell'operazione. In 7 casi la biopsia ha rivelato un carcinoma.

L'A. conclude affermando che la morbilita' e la mortalita' dell'isterectomia vaginale sono minime anche nella pazienti in eta' avanzata. L'isterectomia dovrebbe essere sempre totale onde evitare il pericolo di successivi carcinomi del collo. L'operazione per via vaginale ha il vantaggio di richiedere un'anestesia meno profonda: di consentire un' esecuzione piu' rapido dell'isterectomia addominale. Il periodo di degenza e' minore: una piu' precoce deambulazione diminuisce ol'altra parte il pericolo di complicazioni polmonari.

RESUMEN

Se revisan 218 casos de histerectomía vaginal, 212 pacientes de más de 60 años de edad y 6 de más de 80. Mortalidad negativa. Complicaciones mínimas. Abscesos pélvicos canalizados por la vagina. 7 casos de carcinomas a la biopsia. Lesiones vesicales y rectales reparadas al hacer la histerectomía Fistulizacion negativa

En opinion del autor, la histerectomía vaginal *casi no presenta morbilidad o mortalidad* en ancianas La histerectomía es total y profilactica del desarrollo subsecuente de carcinoma Puede efectuarse con anestesia moderada solamente y levantar temprano a las pacientes Disminución de las complicaciones pulmonares y acortamiento considerable del tiempo operatorio

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Echoes of the Past

V. The Original Description of Thyrotoxicosis

Many men have contributed to the general knowledge of thyroid diseases The first description of the clinical picture of thyrotoxicosis was offered in 1802 Although the author of this entity did not know the complete story of toxic goiter, he nevertheless wrote an excellent observational note

"In a young Spaniard, after three years' residence in this country, appeared a tumor in the anterior part of the neck which in the course of four months increased to a considerable size He remained under treatment for seven months, not so much on account of the tumor as on account of the difficulty he had in breathing and on account of an extraordinary palpitation in the region of the heart The young man realized the seriousness of his condition and applied for relief regarding reduction or removal of the tumor, as it seemed to him that the pressure of the tumor on the subjacent parts was increasing the difficulty he had in breathing At the examination of the tumor I found it of considerable size and as if divided into two parts by a kind of fissure It presented externally the natural color, only the veins were turgid as if varicose, it was not painful to the touch, though pressure on it, with the fingers, rendered respiration more difficult He was emaciated The pulse was regular but not febrile

"The thyroid gland was certainly the seat of the trouble The curative treatment *had to be directed to the resolution of the stagnant tumor For this purpose I* applied a double compress saturated with cold vinegar strengthened by a dose of sal ammoniac This, after twenty days, visibly decreased the tumor by at least one third, the patient breathed with less difficulty Besides this I had him apply during the night a strip of linen of the width of the tumor, with a liniment I obtained the complete resolution of the tumor in four months All the symptoms which accompanied the trouble diminished in proportion to the diminution of the tumor The palpitation disappeared and he soon took up again his occupation as painter, which he practiced until he left Rome, five years after the cure "

The above paragraphs are taken from, "Collezione d'osservazioni, e reflessioni di chirurgia, 1802 " Joseph Flaiani (1741-1808) was the author of the description He was an outstanding surgeon and anatomist of his day Founder of the anatomic museum of the Hospital of the Holy Spirit in Sassia, he was a most skillful surgeon with an excellent practice

In Continental Europe, as a recognition of his priority in describing exophthalmic goiter, this clinical entity is often referred to as Flaiani's disease

—Bernard J Ficarra, M D., F I C.S

Plastic Surgery of the Nose and Chin

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IN the entire field of plastic surgery the most common facial deformities are those of the nose[1] and chin,[2] which have been described in former publications. It is the purpose of this paper to supplement the previous ones with certain phases and changes of technic which have proved to be of value in the plastic correction of these deformities.

Routine Rhinoplasty.—Various rhinoplastic technics are employed by the different schools of rhinoplastic surgery. Each has its merits, and the end results depend largely upon the skill and experience of the surgeon.

The problem of rhinoplasty in cases of vasomotor rhinitis is worthy of thought and discussion. In routine rhinoplasty (Figs. 1 and 2) the nose is narrowed by means of bilateral lateral osteotomy, by detaching the upper lateral cartilages from the septum and by narrowing the nasal tip. This results in diminished aeration of the nasal chambers. It has been pointed out that, if rhinoplasty and submucous resection are performed concomitantly in cases of mild or moderate vasomotor rhinitis, marked physiologic improvement may be anticipated in most instances. Hypertrophied, boggy turbinates have been conservatively treated and their size diminished by repeated submucous electrocoagulations. The final results of treatment by this method were gratifying but involved a number of postoperative office treatments, with additional discomfort for the patient. In an attempt to eliminate these treatments, more aggressiveness and daring was displaced by sacrificing the entire tip of one or both inferior turbinates if they were chronically hypertrophied and obstructive. If the other turbinates were hypertrophied they were fractured laterally to increase ventilation. The results of radical anterior turbinectomy performed in combination with submucous resection and rhinoplasty in allergic noses is gratifying. The noses stayed clean. No unusual crusting occurred. Sneezing and watery discharge diminished considerably, and the patients remained comfortable, having been relieved of their nasal symptoms.

Postoperative Nasal Packing.—At the completion of a routine simple submucous resection and rhinoplasty one is concerned with nasal packing. The procedure of employing a large amount of petrolatum gauze as a pressure dressing on the nasal septum to maintain the mucoperichondrial flaps in place and diminish bleeding has been discarded. Instead, only a very small pledget of petrolatum gauze is inserted into each nostril. When a large amount of this gauze is removed from the nose it is quite common to encounter epistaxis in varying degrees. This involves additional discomfort for the patient and loss of time for the surgeon in waiting for the bleeding to subside. If only a small pledget is removed from a nostril, bleeding is rare. It seems logical to conclude that a considerable number of submucous septal hematomas would develop without a pressure dressing on the septum. Actually, not a single one has occurred in several hundred cases.

An exception is made in the method of postoperative packing, however, in cases of severe deflection of the nose. A surgical method of correcting deflected noses which has worked well is as follows: A typical routine rhinoplasty is performed so that the profile projection, tip narrowing and elevation are satisfactory, no particular heed being paid to the nasal deflection. A mildly deflected nose (Fig. 3) may be repositioned by this maneuver alone. A typical submucous resection is performed if necessary (I perform it concomitantly in about 80 per cent of cases, since exostoses or ecchondroses which may have been symptomless prior to rhinoplasty may become obstructive after the operation).

A moderate or severely deflected nose requires additional procedures. Double or triple saw cuts are made on the broad site in performing the lateral osteotomy, while only a single complete saw cut is made on the narrow

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side. The maneuver of first fracturing outward (Aufricht) and then forcefully manipulating inward will straighten almost any bony deflection (Fig. 11). Occasionally one has to disarticulate the bony septum from the nasofrontal angle[1] before the bony framework of the nose can be pushed to the midline and straightened.

A nose twisted because of an angulation of the septal cartilage may be corrected by the methods advocated by Berson,[3] Peer,[4] or Seltzer.[5] In recent years I have corrected almost every deflection, no matter how severe, by routine rhinoplasty and radical thorough submucous resection (Figs. 4 and 9). After the final shape of the nose has been determined by rhinoplasty, a thorough submucous resection is performed, approximately ⅛ inch (0.32 cm) of septal cartilage being left on the dorsum and about ¼ (0.64 cm.) at the anterior free end. If the remaining anterior free end of the septum is displaced, it is cut through at its junction with the vomer (by a straight scissors cut going through the cartilage and mucoperichondrium on both sides of the septum). The anterior free end of the septum is respositioned in the midline and resutured to the columella. The resilience of the remaining dorsal septal cartilage is not broken. It has a tendency to recoil somewhat to its original displaced position. However, since most of the cartilage has been removed, the recoil is only partial. The septum is then placed in the midline and maintained in the straight position by overpacking the side on which the deflection occurred with petrolatum gauze A small pledget of the gauze is inserted in the opposite nostril. The nose is splinted in the midline by adhesive strapping, and a stent is applied. The small nostril pledget is removed on the third day and the large bulky packing on the seventh day. The stent and the adhesive strapping are removed on the tenth day Enough fibrous adhesions will form to maintain the septal cartilage in the midline.

When a very large hump is removed or a

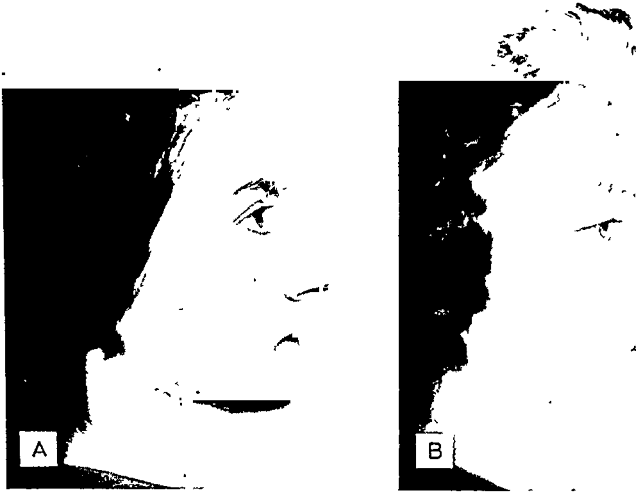


Fig. 1.—*A*, preoperative photograph; *B*, photograph taken after rhinoplasty.

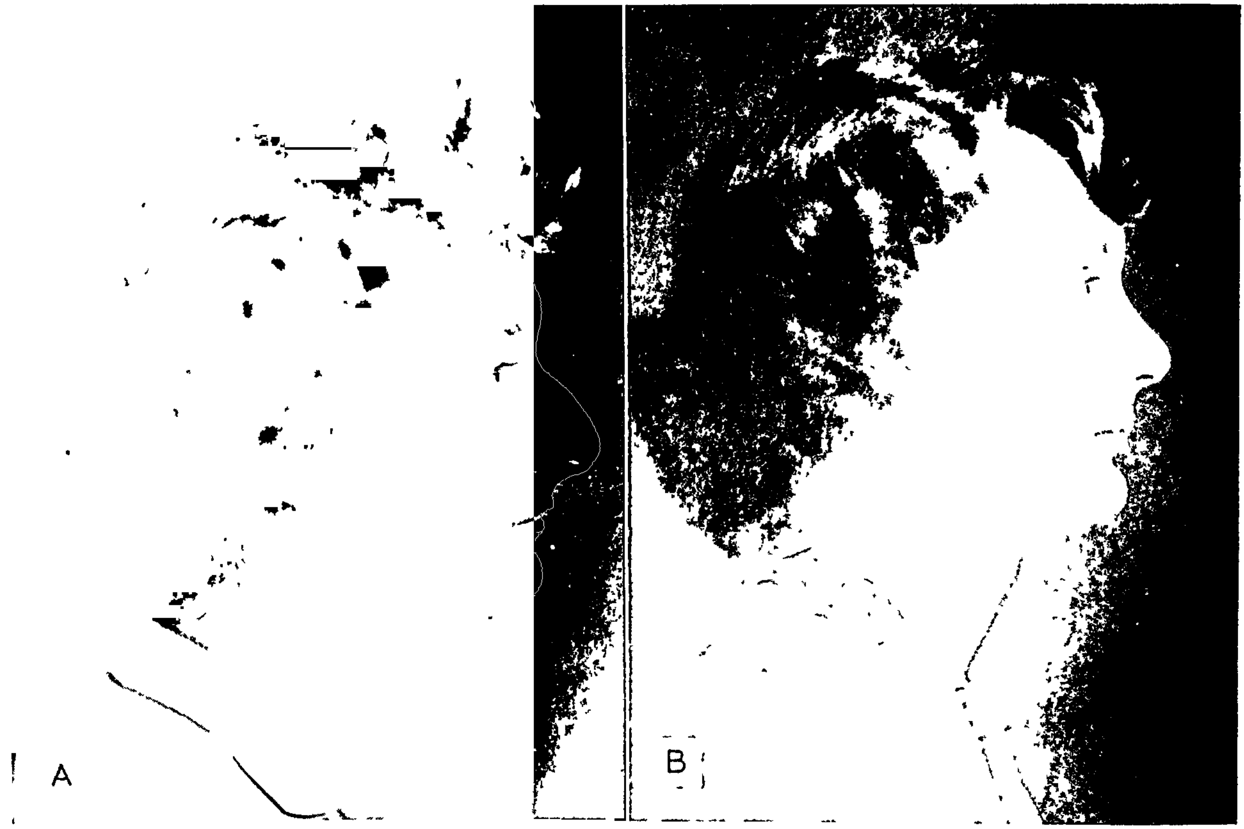


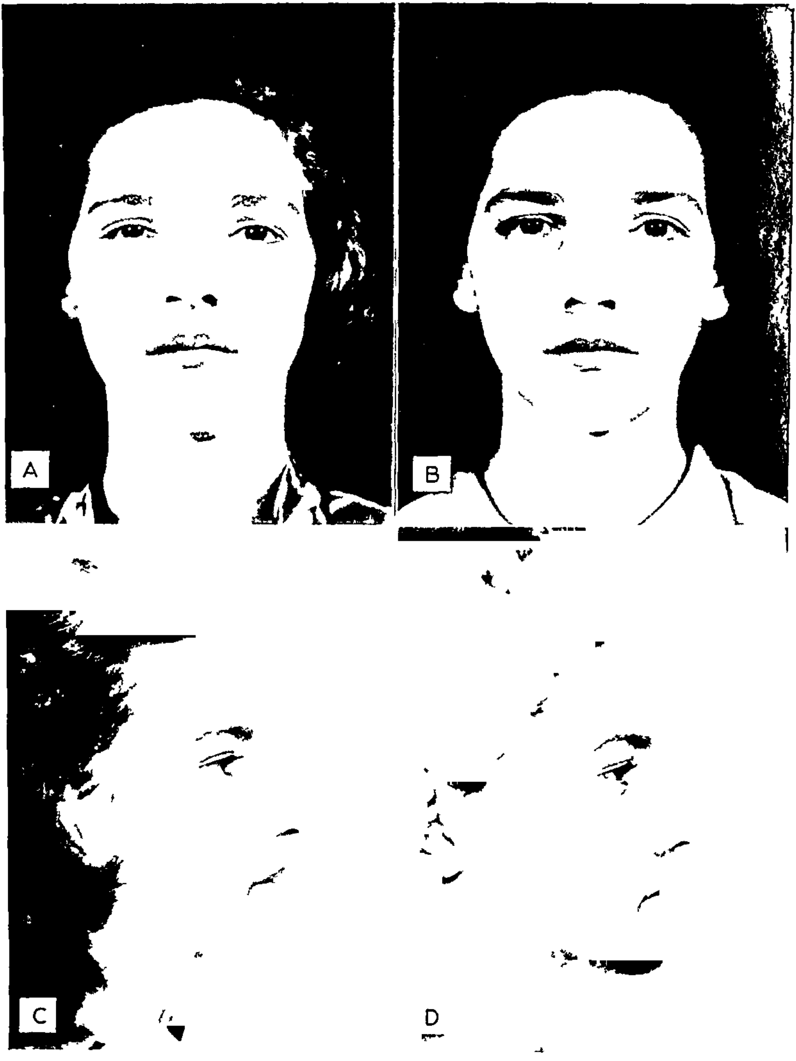
Fig. 2.—*A*, preoperative photograph; *B*, photograph taken after rhinoplasty.

very prominent nose reduced, a considerable amount of excess skin remains on the dorsum of the upper two-thirds of the nose. A subcutaneous pocket is formed in which hematomas may occur. Several weeks must elapse before this excessive quantity of skin shrinks and assumes the modeled operative proportions. A method of hastening the shrinking procedure and preventing hematomas and excessive edema is to employ a pressure adhesive tape dressing for better molding of the skin over the bony and cartilaginous framework of the nose (Fig. 5).

After all the blood has been expressed from the nose, the columella resutured to the anterior free end of the septum and the nostrils packed, the lobule is compressed to squeeze out any remaining novocaine. A thin piece of adhesive tape is employed to hold the tip upward and maintain its narrowness (Aufricht[6]). Wider pieces of adhesive tape are then placed in a transverse direction, beginning at the nasofrontal angle and extending down the dorsum of the nose to the lower lateral cartilages. The strips are placed on the nose with considerable pressure, which forces the skin to fit snugly across the remodeled dorsum of the nose. When the adhesive tape is applied with pressure in this manner the upper half of the dorsum of the nasal tip appears too prominent. A thin piece of adhesive tape backed in the middle by adhesive (Aufrich[6]) is placed over the prominent point to depress it and make it conform with the remodeled nose.

A stent is then applied over the nose. With this method of nasal dressing it has been found

Fig. 3 (opposite).—*A*, preoperative photograph showing mildly deflected nose. *B*, photograph taken after rhinoplasty and radical submucous resection. *C*, preoperative profile. *D*, profile after operation.


A
B
C
D

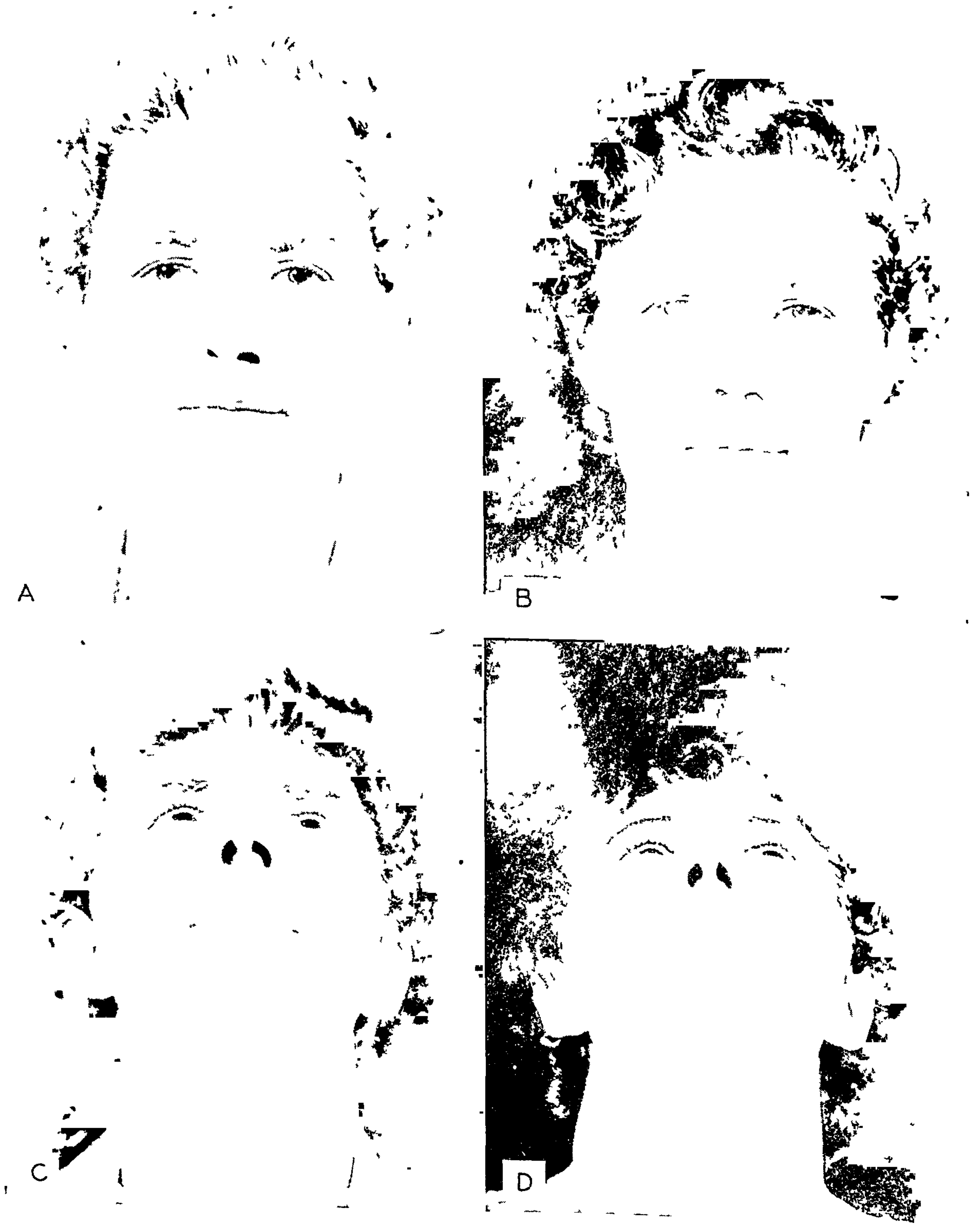


Fig. 4 — *A*, preoperative view showing deflection of septal cartilage *B*, photograph taken after rhinoplasty and radical submucous resection *C*, preoperative anterior view *D*, appearance after operation

that postoperative ecchymoses and edema are considerably diminished The skin shrinks down faster and the nose assumes its final form more rapidly However, edema occasionally occurs over the glabella where pressure strapping is impossible

Deformities of the Chin —Chin deformities are very common congenital malformations It is not uncommon to find deformity of both chin and nose in the same patient and in most instances they can be advantageously corrected at the same operation (Figs 8 and 10)

The use of preserved cartilage has been condemned by some plastic surgeons on the basis of microscopic evidence of absorption of the cartilage The amount of absorption is an important consideration when only small bits of preserved septal cartilage are employed Clinically I have observed that more absorption takes place in preserved septal cartilage than in preserved rib cartilage Furthermore when large pieces of preserved rib cartilage are employed it makes little difference in the final form whether or not microscopic absorption takes place The final form is not altered sufficiently to cause changes in the contour Sixty large implants were made in chins for microgenia and after observation for as long as seven years only negligible changes have been noted

On occasion, the preserved cartilage chin implant was displaced soon after the tight immobilization adhesive tape chin strapping was removed In an attempt to prevent this occurrence, the patients are now instructed to wear a commercial chin strap for several weeks after the adhesive dressing is removed They are advised to wear these straps when sleeping so that no accidental self inflicted displacement will occur

The chin strap employed is the "double chin strap" sold over the cosmetic counter of most drug and department stores (Figs 6 and 7) The straps are worn by all male patients over the adhesive chin dressing since adhesive tape does not adhere to the male beard

The chin strap is also recommended as an effective dressing after various operations on the chin

1 As a pressure dressing over adhesive tape after skin grafting operations on the chin

2 As a substitution for a Barton bandage in the management of certain fractures of the jaws

3 As an added immobilization bandage after operations for prognathism

4 As a pressure dressing after "T plastics on the chin for double chin deformities

5 As a pressure dressing after surgical remodeling of reconstructed chins

6 As a pressure dressing on severe undercut lacerations of the chin

7 As a pressure dressing after "V excision of the lip for carcinoma

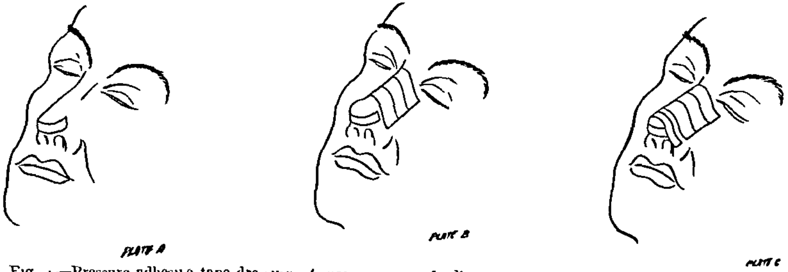


Fig [illegible] —Pressure adhesive tape dressing *A*, narrow piece of adhesive tape across tip of nose (Aufricht) *B* wider strip across dorsum *C* narrow strip of adhesive tape backed by adhesive to depress prominent tip (Aufricht)

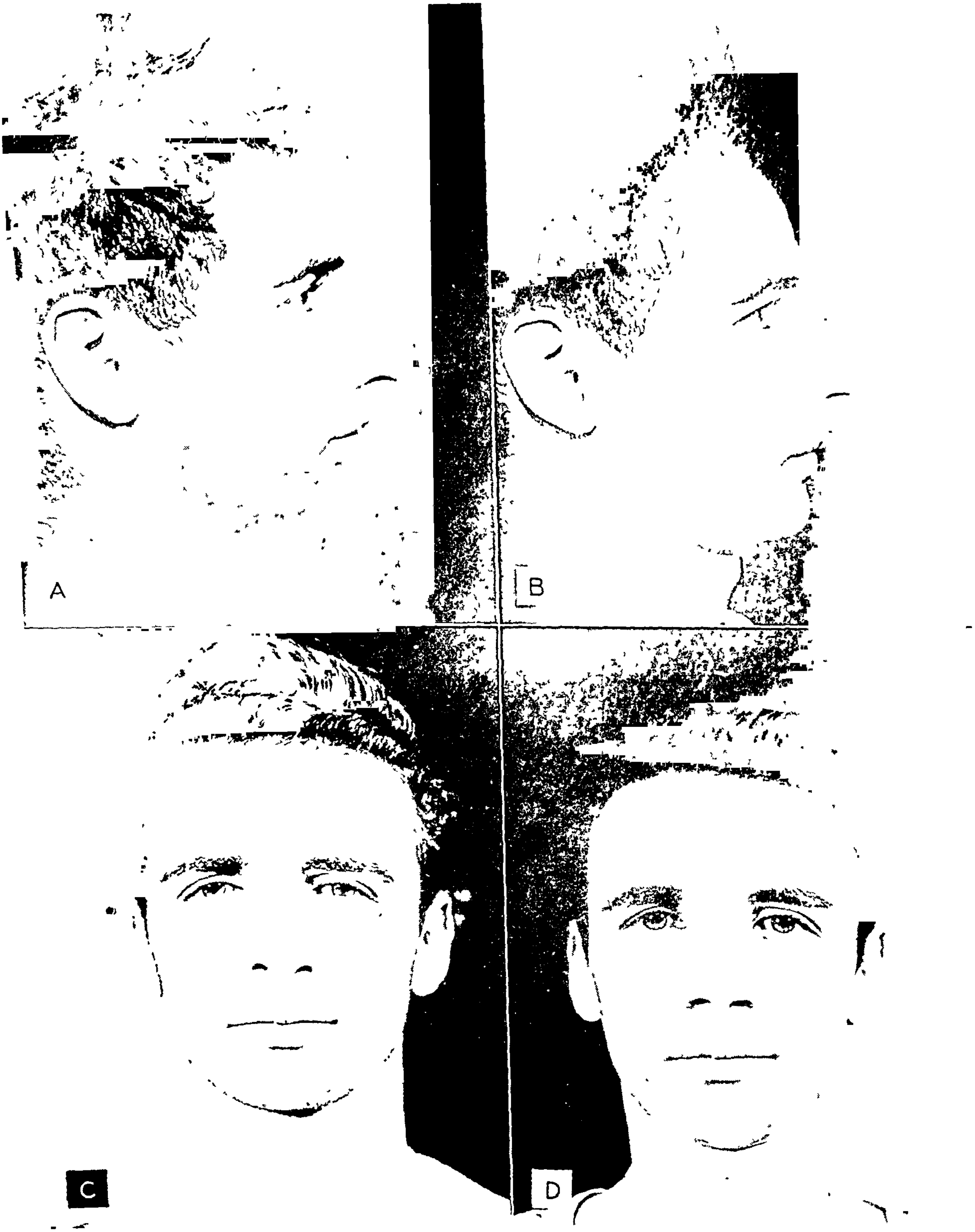


Fig. 6.— *A*, preoperative view showing prominent nose and receding chin. *B*, photograph taken after rhinoplasty and chin plastic. *C*, preoperative anterior view. *D*, appearance after correction.

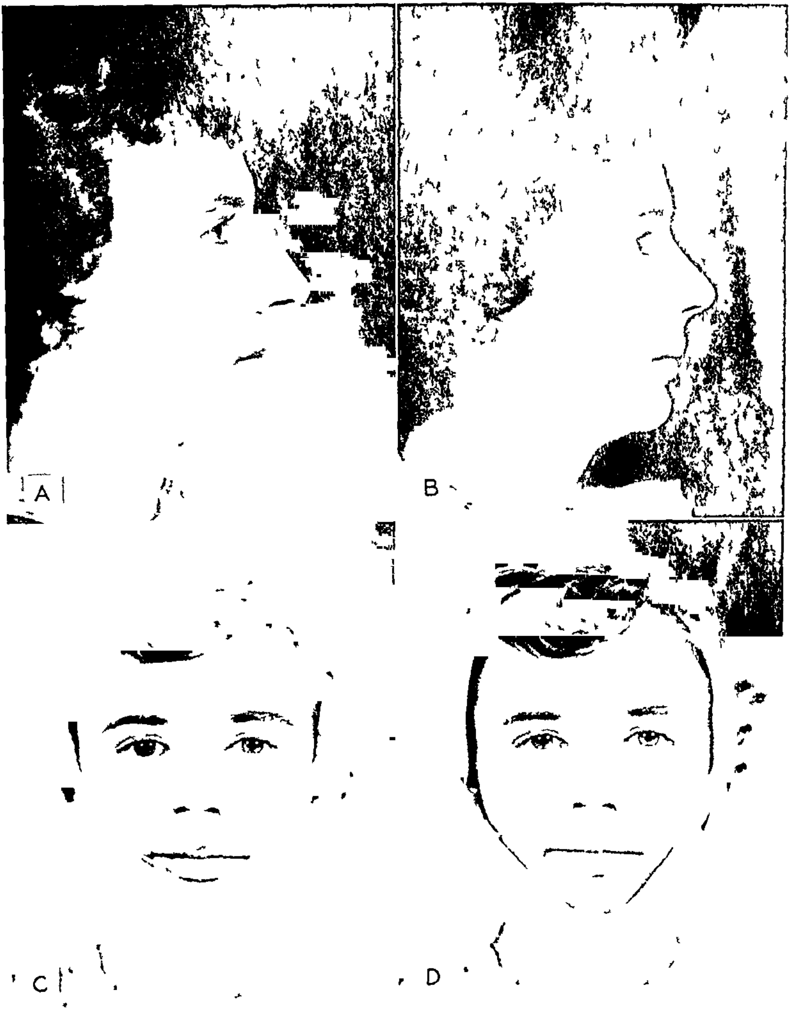


Fig. [illegible].—Sister of patient in Figure 6. A, preoperative view showing prominent nose and receding chin. B, photograph taken after rhinoplasty and chin plastic. C, patient wearing commercial double chin strap. D, another form of commercial double chin strap.

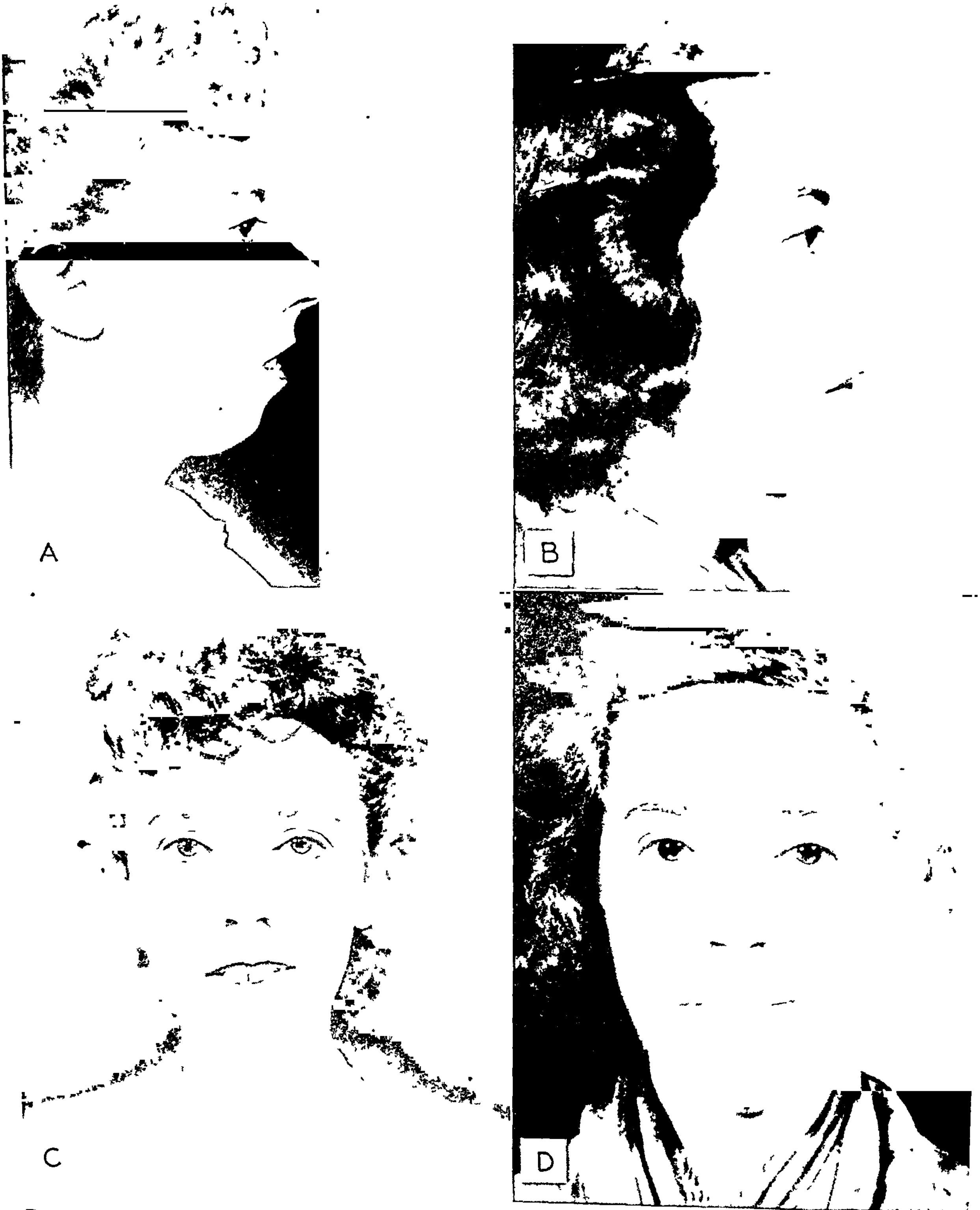


Fig. 8.—*A*, preoperative view showing prominent nose and receding chin. The patient had previously undergone a rhinoplastic operation. *B*, photograph taken after second rhinoplasty and preserved cartilage chin implant. *C*, preoperative view; *D*, photograph showing result.

8 As a pressure dressing after a suprahyoid disection of the neck

9 As a pressure dressing after skin grafting of the gingivolabial sulcus

10 As a pressure and immobilization dressing after bone grafts to the chin

SUMMARY AND CONCLUSIONS

Radical resection of one or both tips of the anterior turbinates is advocated in cases of moderate or severe vasomotor rhinitis when the turbinates are chronically hypertrophied and obstructive The results of radical anterior turbinectomy performed together with submucous resection and rhinoplasty in patients with vasomotor rhinitis is gratifying

Small pledgets of petrolatum gauze inserted in the nostrils rather than in the nasal chambers themselves after submucous resection and rhinoplasty is more efficacious than bulky packing inserted into the nose

Almost any deflection of the nose can be corrected by routine rhinoplasty together with radical and thorough submucous resection

A pressure adhesive tape dressing applied under a stent diminishes postoperative ecchymosis and edema and enables the nose to assume its final form more rapidly

A chin strap is recommended to help prevent displacement of chin implants This strap may also be employed after various other plastic operations on the chin

RESUME

La résection radicale d'un ou des deux bouts des cornets inférieurs est recommandee dans les cas de rhinites vasomotrices moderées ou sévères quand les cornets sont chroniquement hypertrophies et obstructifs Les resultats de turbinectomie inférieure radicale accompagnée d'une résection submuqueuse et de rhinoplastie chez les malades souffrant de rhinite vasomotrice sont très satisfaisants

Des petits cordons de gaze pétrolisés insérés dans les narines plutôt que dans la chambre nasale après résection submuqueuse et la rhinaplastie sont plus efficaces que des tamponnements massifs introduits dans le nez

Presque toute déflection du nez doit être corrigée par une rhineplastie ordinaire avec résection submuqueuse radicale et entière

Une pression à l'aide de gaze appliqueé comme une tente diminue l'ecchymose et l'édème postopératoire et permet au nez de prendre sa forme finale plus rapidement

Un soutien est recommandé pour empêcher le déplacement de greffes mentonnières Ce support peut etre employé après différentes opérations plastiques sur le menton

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

In Faellen von maessigem oder schwerem vasomotorischem Nasenkatarrh wird die radikale Spitzenresektion einer oder beider vorderen Nasenmuscheln empfohlen, falls die Muscheln chronisch hypertrophiert sind und Verstopfung verursachen Die Ergebnisse, die mit radikaler vorderer Muschelresektion in Verbindung mit submukoeser Resektion und Rhinoplastik bei Kranken mit vasomotorischem Nasenkatarrh erzielt wurden, sind erfreulich

Die Einfuehrung von kleinen Vaselingazetampons in die Nasenloecher und nicht in die Nasenhoehlen selbst ist nach submukoeser Resektion und Rhinoplastik wirksamer als das Ausstopfen der Nase mit dicken Packungen

Fast jede Verbiegung der Nase kann mit gewoehnlicher Rhinoplastik in Verbindung mit radikaler und sorgfaeltiger submukoeser Resektion ausgeglichen werden Ein Heftpflasterdruckverband verringert postoperative Ekchymosen und Oedem und gestattet der Nase eine beschleunigte Annahme ihrer endgueltigen Gestalt

Eine Kinnbinde wird zur Vorbeugung der Verschiebung von Kinnimplantaten empfohlen Diese Binde kann auch nach verschiedenen anderen plastischen Kinnoperationen Anwendung finden

RESUMEN Y CONCLUSIONES

La resección radical de una o ambas extremidades del cornete anterior está indicada en casos de rinitis vasomotora moderada o severa, en que los cornetes se encuentran crónicamente hipertrofiados y obstruidos Son satisfactorios los resultados de la resección radical con resección mucosa y rinoplastía en pacientes con rinitis vasomotora

Pequeñas compresas de gasa vaselinada introducidas en las ventanas nasales mejor que en las fosas nasales, después de la resección mucosa y rinoplastía, son más eficaces que el gran taponamiento intranasal

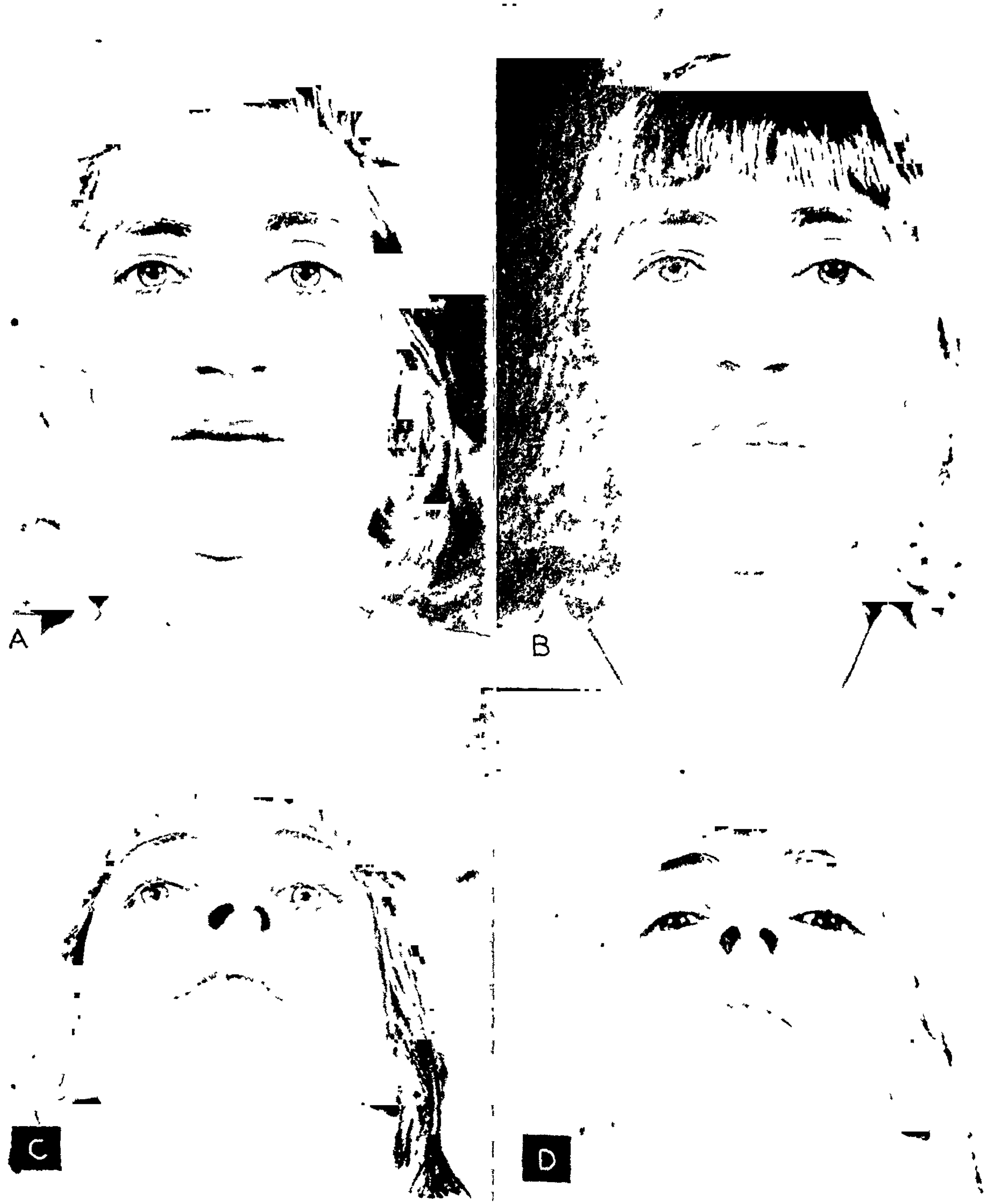
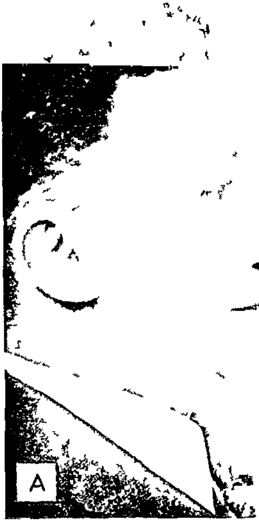


Fig. 9.—*A*, preoperative view showing deflection of septal cartilage. *B*, photograph taken after rhinoplasty and radical submucous resection. *C*, preoperative appearance. *D*, appearance after correction.

Fig. 10 (opposite).—*A*, preoperative view showing dishface deformity; depressed nasal tip and receding chin. *B*, photograph taken after routine rhinoplasty and preserved cartilage chin implant. *C*, preoperative anterior view. *D*, appearance after correction.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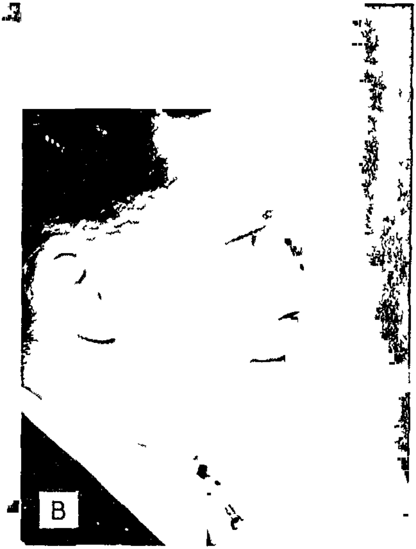
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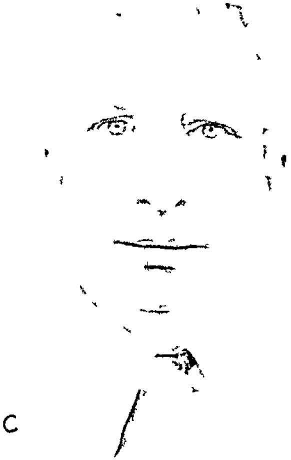
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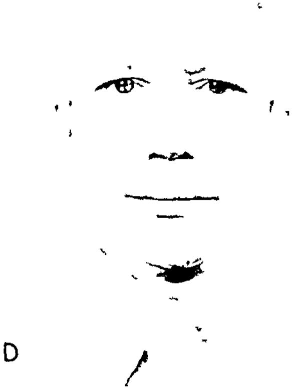
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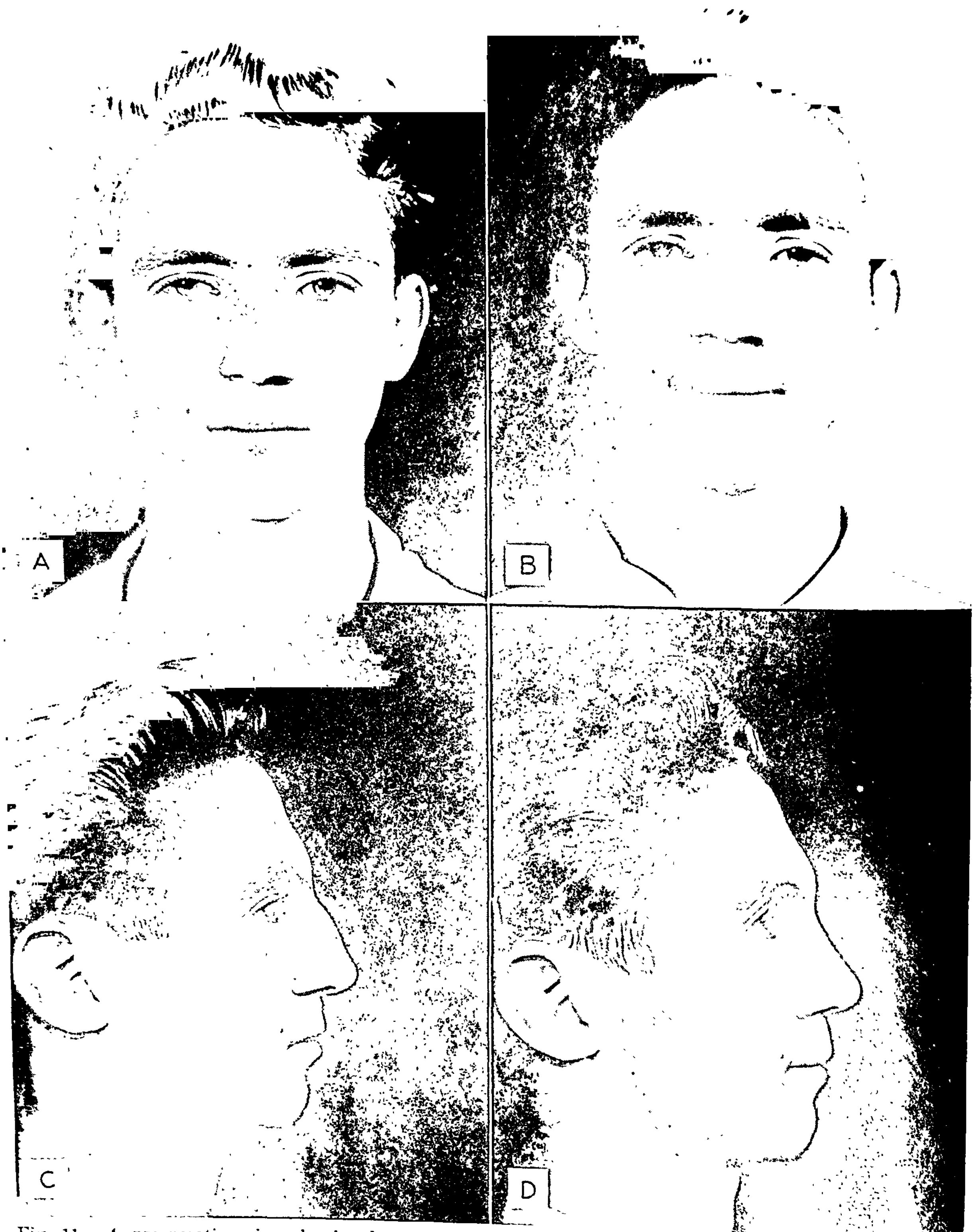

Fig. 11.—*A*, preoperative view showing bony deflection of nose. *B*, photograph taken after rhinoplasty and radical submucous resection. *C*, preoperative profile; *D*, profile after operation.

Cualquier desviación de la nariz casi puede corregirse con la rinoplastia de rutina junto con la resección mucosa radical

Un apósito aplicado con vendaje adhesivo compresivo disminuye la equimosis y el edema postoperatorios, siendo mas rapido el proceso para que la nariz adquiera su forma final

Se recomienda un vendaje de la barba para ayudar a prevenir desplazamiento de injertos de la misma Este vendaje puede emplearse tambien despues de otras diversas operaciones plasticas de la barba

RIASSUNTO

Pone in evidenza la risezione radicale d un od ambedue punte turbinati anteriori in casi di rinite vasomotore sia moderato o severo quando i turbinati sono ipertrofici ed ostruttivi I risultati del turbinettomia radicale anteriore insieme al risezione sottomucosa e rinoplastia sono gratificanti

L inserzione di piccoli pezzi di tocca a petrolatum inseriti nelle narici, piuttosto che nelle camere nasali dopo risezione sottomucosa e rinoplastia e' piu efficace del imballaggio voluminoso del naso

Quasi ogni flessione del naso puo essere retto per pratica rinoplastica insieme a la r zione perfetta sottomucosa radicale

Ecchimosi ed edema postoperativo diminu cono per mezzo di medicazione con nastr adesivo stretto sotto una forma e rende capac al naso di la forma finale rapidamente

Raccomanda fascia al mento per impedire il rimovimento degl impianti al mento e pure in oltri operazioni plastici sul mento

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To Our Contributors Abroad

We regret to announce that under current publishing conditions it has become impossible for the *Journal* to arrange the translation into English of original articles submitted in other languages With the single exception of articles written specifically for the Seccion en Espanol, which, of course, do not require translation we must therefore request that all articles henceforward be submitted in the English language

Prompt publication can be greatly facilitated if all manuscripts are typed in double or triple space to allow room for editorial corrections Your cooperation will be deeply appreciated

The Uses of Refrigeration in Surgery

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It is about nine years since we began using low temperatures on the peripheral vascular diseases service at the New York City Hospital. Our problem was death. The patients with gangrene of the feet died if they were not operated upon and, with the methods we used at that time, four out of five died after operation. There were four surgical services, manned by complete teams on duty for three months and off for nine months. The department of anesthesia was well conducted; yet death was our problem.

The members of the medical services had no choice but to decide whether they preferred that their patients die without operation, or subject them to such highly unsuccessful surgery. At the City Hospital we had to accept every patient who came to us, either through the dispensary or transferred from other hospitals. We could not discharge a patient unless he had somewhere to go and someone to care for him. The patients had more than gangrene. They were old, under nourished, poorly clothed and generally neglected—and with multiple pathologic states. They were bad risks at best.

In 1940, we had a mortality, after amputations, of 55 per cent, which was low only because our medical friends dared to refer but 20 in the entire year. It had made no difference who operated or the type of anesthesia, most of these people died in spite of the fact that the surgical teams compared favorably with those of any other clinic.

A definite selection of risks was routine and the patients were completely prepared. Preoperative and post operative care was good.

After many years of painstaking research in his animal laboratory in New York, Dr. Frederick M. Allen published his experience with refrigeration anesthesia in 1937. Until we met in 1941, he had had very few of his patients operated upon, because he could induce but one surgeon to operate, even though Allen prepared the extremity. The technique he taught me remains the best I have heard or seen.

A series of 57 amputations was quickly completed with a mortality of less than 15 per cent, in a group of unselected patients. If we could convince ourselves that the gangrene of the foot was a definite contributing factor to the patients' serious condition, the part was removed, regardless of any other factors. Because shock is not possible with refrigeration, we were not as daring as we were considered.

A patient with a history of coronary heart disease, had an embolectomy which seemed successful for twenty-four hours. Then an embolus formed in the popliteal and further surgery was refused. Day after day she was advised to have an operation, even an amputation if necessary. After three days a definite line of demarcation appeared in the lower third of the thigh and, since the patient refused the treatment we suggested, the extremity was encased in ice bags from the mid-thigh to the tip of the toes. In a day, no further sedation was required and, as the weeks passed, the line of demarcation began to fade until six weeks later only the foot showed circulatory changes. She died of coronary disease. That was our first clinical experience with refrigeration as a preservative and making it possible for the development of new blood vessels. From then on our first effort was to save the part, not to remove it.

Cold has the unique property of simultaneously inhibiting pain, shock, exudation, infection and tissue devitalization. It thus serves for a number of medical and surgical uses. The main reason the list of users is not considerably larger is habit together with some misconceptions.

The physiological effects of cold vary widely, as pointed out by Allen,[1] not only according to the degree, time and other physical factors but also according as it may involve the whole body, local parts connected with the body, or local parts isolated from the body. While

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heat beyond a certain degree is absolutely destructive of all life, no such limits exist for cold. Some of the lowest forms of life, such as the bacteria, survive temperatures as near as possible to absolute zero, apparently for an indefinite time. Some vertebrates can withstand freezing for short periods. Still higher species, the hibernators, withstand temperatures only slightly above freezing for many months, during which time their heart action, respiration, and other vital functions are extremely reduced. The higher mammals and man are less resistant, but still a distinction must be made between the effects of actual temperature reduction and reactions which strive to prevent the reduction. A man exposed naked to severe cold dies within a few days from exhaustion due to shivering and other reactions which strive to maintain normal temperature. Temple Fay showed that when these reactions are inhibited by sedatives and the body cooled rapidly, temperatures below 80 F can be tolerated safely for days.

Local parts of the body tolerate cold of a degree which would be fatal for the whole body. Thus limbs or ears can be frozen solid and survive if the time is not too long. Degree of temperature is a factor as well as time, so that freezing by solid carbon dioxide or liquid gases causes gangrene much more quickly than ordinary ice temperature. This is one danger to aviators in the extreme cold of high altitudes. Nevertheless it is not generally realized that freezing at these excessively low temperatures can be tolerated for one minute without harm to such delicate structures as the liver, the blood vessels and brain tissue.[2] Here also distinctions must be made. Limbs or other structures subjected to excessive degree or duration of freezing, even with solid carbon dioxide, do not become gangrenous from the cold but only secondarily from the thrombosis which results from the vascular damage. Practical therapeutic use is made of Lange's discovery[3] that prevention of thrombosis by heparin prevents necrosis and the frozen tissues survive. Even without heparin, it has long been known that rapid warming after frost bite or "trench foot" may precipitate gangrene in cases where the gradual warming may save the tissues. In the recent accident to Sumner Welles, our former assistant Secretary of State, the newspapers reported that not only was heparin used but also the exposed limbs were kept cool for several days.

When local parts are separated from the body, still other differences appear in the direction of a return to the resisting power of *primitive protoplasm. Thus, human spermatozoa* can survive temperatures near absolute zero for an hour or longer. Mouse cancer has grown after having been kept frozen for two years. The usual rule that the lowest temperature kills in the shortest time is often reversed, in the sense that the lowest temperature preserves for the longest time. For example, skin in its normal position sloughs after rather brief ordinary freezing and more quickly if frozen by solid carbon dioxide or liquid air, as already stated, but skin grafts are preserved for days or weeks by cold and are preserved better at the temperature of carbon dioxide ice than in an ordinary ice box.[4] It was also mentioned that the bloodvessels are normally most sensitive, so that their injury results in thrombosis which is the direct cause of gangrene; but blood-vessel segments are preserved for weeks or months at the temperature of solid carbon dioxide,[5] and then function successfully as grafts with no tendency to cause thrombosis. Radical chilling of any part of the body surface gives rise to various nervous and vascular reactions one of which is a red flush, shown by Lewis to be a local discharge of histamine-like substances. These reactions are absent not only in the amputated limb but also in a limb which is isolated by a tight tourniquet or by thrombosis of its main artery; and they are greatly diminished when the circulation is reduced by arteriosclerosis. The fears which have been promulgated by various writers concerning the clinical uses of refrigeration have been based upon total ignorance of these peculiarities of the action of cold under different conditions.

With this background we may summarize some of the therapeutic applications of cold as observed not merely by ourselves but especially by a large number of other workers.

Amputations.—The method of refrigeration anesthesia is doubtless now familiar, consisting of the stoppage of blood flow by a tourniquet and the application of ice or apparatus long enough for through and through chilling of the part. This time may vary from 15 minutes for a finger to three or more hours for a thigh, since it depends upon the thickness of tissue to be penetrated by the cold. (A short man weighing 360 pounds had a tremendous thigh and required four hours to anesthetize.) The result is anesthesia because the cold nerves do not transmit impulses. Furthermore, there is a unique absence of shock because not only nervous but all protoplasmic functions are in abeyance. Therefore, this is the only method whereby a patient can eat a full meal immediately before a major operation and another one immediately afterward and behave in general as if there had been no operation. One of my guests at the Clinic visited a man he had seen operated, after the patient had been returned to the ward. The doctor asked if the patient had much pain or discomfort at the time of the operation. In a disappointed tone, the patient wanted to know how he could have had pain when all they did was to keep him in the operating room for a half hour, then send him back to the ward without operating upon him. These advantages are generally accepted in poor risk patients. In other cases, most surgeons still use methods which appear more habitual or convenient. The refrigeration method can be made convenient when the operator and his staff are accustomed to it, and especially if ice can be replaced by the electric unit which is thermostatically controlled. One surgeon told me the anesthesia was perfect but he would not use it again because his resident refused to get up at three o'clock in the morning to encase the patient in ice. The surgeon was informed that all the resident has to do is properly apply the tourniquet by getting up about fifteen minutes earlier than his usual arising time. The preparation of the tourniquet site and after the tourniquet is in place, the complete encasement of the extremity in ice are duties of the ward nurse. We have always opposed the surgeon's convenience as a reason for inflicting shock on any patient who is regarded as strong enough not to die from it. A doctor who is very well known all over the world refused to try refrigeration anesthesia because of his complete satisfaction with a saddle type spinal. When reminded that even he had had patients die as a result of spinal anesthesia, he agreed but said that is to be expected. No patient can die as a result of the low temperature anesthesia.

Other Operations on the Extremities.—Refrigeration has special advantages for orthopedic and reconstructive operations, in the preservation of tissue vitality and control of post operative pain and edema. The practical benefits were demonstrated statistically by Schaubel.[6] The effects of cold being not injury but preservation, it remains only to discuss the tourniquet. The convenience of absence of blood flow is recognized. Possible tourniquet injuries must be recognized, though they are reduced in proportion to the temperature.

We have never encountered trouble from vascular damage or thrombosis, even in advanced arteriosclerosis. On the contrary, thrombotic accidents are greatly reduced by the better tissue preservation and the direct inhibition of clotting. In our work we have, on occasion, been embarrassed by taking a longer time to control an ooze when closing the wound than for the operation itself. We never have seen a blood clot. Nerve damage is less important in amputations than in other operations and though it is reduced by cold, paralysis can occur from prolonged tourniquet constriction, particularly in the arm where nerves may be crushed directly against bone. The procedure is a matter of choice and conditions. When circulation is greatly reduced by arteriosclerosis, effective chilling is possible without a tourniquet, merely by lengthening the time of refrigeration. This plan is used occasionally even for amputations.[7]

Dr. James Lisa, our pathologist at the Hospital, examined every extremity removed and in addition to the usual complete specimen autopsy he was asked to determine whether there was gross and/or microscopic evidence of structural changes due to the prolonged periods of chilling; or, did the pressure of the tourniquet damage the tissues from the skin down to and including the bone, especially the blood vessels which are almost normal and the ones in an extreme degree of sclerosis? Inasmuch as the tourniquet may be placed 12 to 18 inches proximal to the line of incision, there had been no opportunity to examine the exact area of pressure. With this in mind, a 74-year-old patient who was scheduled for a supracondylar amputation, had a tourniquet applied two inches below the site of the proposed skin incision, and left for twenty seven hours with the extremity refrigerated After the first tourniquet had been in place for twenty four hours, the entire extremity was prepared for the operation by placing a second tourniquet around the upper third of the thigh Following amputation, the specimen with the first tourniquet still in place, was sent to the laboratory If our type of tourniquet, which is a one half inch rubber tubing, is properly applied with the refrigeration continuous there will be no pressure changes Dr Lisa examined the tissues proximal to, then at the pressure site and finally, distal to the tourniquet He reported there were no changes from either the low temperature nor from compression, after twenty seven hours' application

Legs with normal circulation can be chilled as high as the knee without a tourniquet Breaking up adhesions about the ankle and the knee and other orthopedic procedures have been performed advantageously [8] A thigh of ordinary thickness and circulation cannot be anesthetized satisfactorily without the use of a tourniquet Gratz has shown, however, that anesthesia without prolonged tourniquet pressure can be obtained by continuous refrigeration and intermittent tourniquet applications The tourniquet is left in place for any desired time, from fifteen minutes to an hour, then removed to allow circulation for a short time and replaced, perhaps at a different point If disability were to result from the narrow tourniquet it would be transitory Never are there permanent paralyses or contractures such as may complicate the use of broad constrictions

This fact was illustrated in the case of a man aged 55 years, with a four plus Wassermann and rather poor general condition For special reasons, not connected with anesthesia tourniquet constriction was used for an exceptionally long time without chilling It was a cold day in December, the ward temperature was 72 and under the bed cloths it was 89 degrees F No refrigeration was used The tourniquet was applied and held in place for seven hours and ten minutes at this temperature Distal to the tourniquet, the skin was blanched and there was no edema When the constriction was released, the foot and leg swelled to twice the normal size There was severe inflammation but no necrosis Motor and sensory paralysis gradually cleared up during several months This case is recited to impress the fact that damage resulting from a properly applied narrow tubing at room temperature, is not a permanent paralysis

An especially made narrow, air tourniquet is not as painful as the tubing Experiments among the members of the staff were interesting After the oscillometer cuff had been applied immediately above the ankle and the graph recorded, no one of us could stand to have the tubing tight enough to cut off the oscillations when the tourniquet was placed immediately above the knee With the narrow air cuff, the oscillations were cut off when the gauge showed 6 pounds, and each of us could endure the pressure until the gauge showed thirteen pounds

It should not be long before enough is known about tourniquets to remove the dread which now exists among the inexperienced

Fractures —While refrigeration can be used it is neither necessary nor convenient for ordinary fractures It has value in exceptional cases of multiple fractures with considerable shock or when tissue vitality is endangered by mangling of tissues by thromboses, or when operations must be delayed, as when injuries are sustained at a distance from a hospital

Delayed Operation —Classic examples are the following 1 McElvenney's case[9] of amputation of both legs by a railroad train, packing in ice to control pain, infection and tissue devitalization for fifty eight hours until shock could be overcome sufficiently for successful surgical amputation 2 Mock's cases[10] of crushed pelvis with thrombosis of iliac or femoral arteries, presenting the dilemma of shock death with immediate amputation, or gangrene death with delay The extremities were preserved in ice for two and one half weeks of general convalescence, and final amputation above the knee, instead of near the hip 3 Ottaway and Foote's case[11] of a seaman on a destroyer whose femoral artery and vein were severed 6 cm below Poupart's liga for almost a month until the patient could be ment by a shell fragment painless preservation transferred for successful amputation above the knee, thus adding a further example of the development of collateral circulation in refrigerated tissues. 4. The cases of Nachlas[12] in which blast injuries were so severe that the only immediate treatment for mangled hands would have been amputation. Ice preservation of the hands during two weeks of constitutional recuperation permitted successful reconstruction.

In many conditions, the use of refrigeration is optional. It should be noted that in cases such as those here illustrated, there is no choice, because there is no means for saving life or limb except by the use of low temperatures.

Limb Infections.—Fulminant limb infections which threaten life can sometimes be controlled by refrigeration. Ferguson[13] reported benefit in the treatment of gas gangrene. When an extremity is to be sacrificed, a tourniquet can amount to a shockless emergency operation (amputation) but it should be omitted if there is hope of saving the part. The purpose of refrigeration may be conceived as two fold. First, it clears up the odor and dark color of tissues and exudates, and the appearance of increased oxygenation suggests a better defense against anaerobes in addition to the general inhibition of bacteria by cold. Second, the retarded formation and absorption of toxins gains time for drug and serum treatments to become effective, and the anesthesia prepares for surgical drainage or amputation.

Hemorrhage.—Severe hemorrhage can sometimes be stopped only by a tourniquet, especially under emergency conditions. Interrupted tourniquet applications, as recommended in first aid instructions, are by no means harmless. It is often possible to reduce the temperature with ice or cold water. And emphasis should be placed upon the basic principle that injury will be lessened in proportion as the temperature is lowered. It may thus be possible to leave a suitable tourniquet in place for a number of hours, or at least to reduce the number of changes and minimize inflammation and any devitalization. The free blood flow seen when a tourniquet is removed from a refrigerated extremity, and the previously mentioned development of collateral circulation during prolonged refrigeration serve to dissipate fears of vasoconstriction from cold. On the contrary, there are theoretical grounds for hoping that the contraction of collateral branches following the wound of an artery may be released by cold even better than by procaine.

Thrombosis and Embolism.—Since the clotting of blood is an enzymatic process, the above mentioned inhibition by cold is obvious. Equally important is the evidence of preservation of vitality in the vessel wall and the surrounding tissues. When the main artery of an extremity is occluded, completely, the result is the same as in traumatic cases mentioned under "delayed operations." We have had several experiences of preservation of limbs for several weeks after embolism; however, the final result must be amputation, and the only advantage is the delay of operation when necessary, for example, in a severe cardiac case. The greatest theoretical usefulness of refrigeration for embolism has never yet received practical trial. The principle already proposed[11] is that as soon as complete occlusion of a main artery is diagnosed, either in a hospital or in the home, the extremity should be immediately refrigerated, and preferably, a tourniquet should be placed proximally to the site of the embolus.

The general purpose of refrigeration is to control pain, shock and devitalization of vascular endothelium and general tissues, and to arrest further clotting and adherence of clot to the vessel wall. The tourniquet sets an absolute limit to upward propagation of the thrombus. It stops inadequate collateral circulation and facilitates the necessary deep chilling. The limb is thus ready for operation without other anesthesia. The hope is that this plan will extend the time and improve the results of embolectomy. Restoration of circulation may be successful after intervals measured in days rather than in hours as at present. Trials of the plan may be valuable and at most should be harmless.

Information of this nature should be given the general practitioner for it is he who sees the patient first. Too often the doctor waits for the development of additional symptoms so that by the time the correct diagnosis is made and a consultant summoned, too many hours have elapsed for a successful embolectomy. The diagnosis of embolism usually is not difficult if this condition is borne in mind. The history of a very acute onset with an excruciating and persistent type of pain should be sufficient to make the doctor appreciate that an urgent emergency is at hand If the extremity could be packed in ice while the diagnosis is in the making and the refrigeration continued until the patient reaches the operating room, his chances for success will be enhanced An acute excruciating persistent pain should make the diagnosis If the diagnosis of embolism proves to be incorrect, the treatment with low temperatures will do no harm If the physician will consider every acute excruciating, persistent pain as an embolism he will be right more often than he will be in error

Shock —The inhibition of shock by cold is practically complete in the sense of prevention, that is, when the tissues are chilled before the trauma is inflicted The protection is in proportion to the degree of cold—short of freezing The optimum temperature is probably 10 C or 40 F and at this temperature tissues are practically as unreactive as dead tissues, so that any number of operations can be performed with no shock other than that of the wound remaining after normal temperature is restored The therapeutic effect, when cold is applied after the injury, is far less although still definite Thus refrigeration was a standard feature of the treatment of crush injuries during the war time bombing of England The main fact is that the immemorial tradition of warmth for shock has been overthrown since Allen's original experiments[15] have been confirmed by all subsequent investigators For generalized shock a reduction of body temperature by two to four degrees seems advisable The benefit of radical chilling of accessible local wounds, as in the limbs, is fully established This treatment may be combined with local compression, which originated in England during the war The disadvantage or danger of compressive dressings is the harm to poorly nourished tissues and the incubation of bacteria Cold counteracts these dangers besides adding its own benefits

Frostbite and Burns —Other authors have confirmed the experience of Webster, Woolhouse and Johnston[16] that prolonged applications of moderately reduced temperature relieves pain, circulatory and nervous disturbances and lessens the need for amputation in cases of exposure, frostbite and "trenchfoot "

Burns preeminently demand the unique property of cold for simultaneously controlling pain, shock, exudation infection and tissue devitalization After our small preliminary experience[1] in New York City Hospital, the most striking case was that of Kross[18] which involved saving the life and limb of a woman who was moribund after a neglected infected burn from the mid-thigh to the tips of the toes The patient was referred to the Hospital for an immediate high thigh amputation She was septic Dr Kross decided that if low temperature was of any value in burns it should be demonstrated here He ordered that the patient was to receive no narcotic sedative, aspirin or antibiotics She might have mineral oil and/or castor oil by mouth for constipation, and nothing else No debridement was permitted except the irrigation of the parts with chilled saline which mechanically washed out the already separated dead tissue The burned areas were covered by a loosely applied plain vaseline gauze, single thickness and the blanket attached to the electric unit encased the vaseline gauze covered extremity The technique is the same when ice bags or cracked ice is used Because we were so handicapped with less than half of the usually required personnel, this case could not have been treated with the ice method Treatment was necessary for the longest period of refrigeration reported, namely, eleven weeks When a limb is to be sacrificed, as in cases here reported, the lowest continuous temperature gives the best preservation, but when the limb is to be saved, healing is facilitated by the highest temperatures that are safe Thus, in the Kross case, radical refrigeration near ice temperature was maintained during the first few days to check infection and intoxication, after which the skin temperature was kept between 60 F and 70 F most of the time, because a higher temperature brought a return of pain and fever, and a lower temperature would have needlessly retarded healing

The best effect of cold treatment is obtained by the most thorough chilling with ice or cold water as soon as possible after the burn Not only are pain and other immediate symptoms relieved, but the subsequent inflammation and necrosis are greatly diminished Every time the burned area is dressed, the single thick ness of vaseline gauze is painlessly removed, and with it comes the separated tissues. Irrigation with chilled saline more thoroughly cleanses the part. Bacteria cannot grow at this temperature. Since burns are superficial, the treatment is feasible for all parts of the body, not merely for the extremities. In the treatment of extensive burns, ice involves considerable labor, pressure, uncertain temperatures and other disadvantages. When prolonged treatments are required, the electric unit‡ gives the best results, with applicators adapted to the various regions and needs.

Miscellaneous Uses.—The delay of absorption by cold is illustrated by Yudin's report[19] that rabbits are saved from lethal quantities of mustard gas by chilling the site of application. This principle, together with the relief of pain, recommends the method for treating bites and stings of insects, spiders, scorpions and snakes. The prevalent use of a tight tourniquet for snake bite is a harmful fallacy, except in cases dangerous enough to require saving the life by a subsequent amputation of the extremity.[20] Cold can reduce both tissue damage and absorption, besides providing anesthesia for the pain and facilitating the usual incisions and drainage. It should therefore be a standard essential of the treatment.

One of our earliest experiences, namely the dramatic results with gangrenous and infected extremities, illustrated this same principle. A patient with a decomposing leg, high fever, collapse or unconsciousness becomes transformed within twenty-four or forty-eight hours after the packing of the part in ice, with or without a tourniquet. The formerly hopeless operative risk becomes hopeful.

The chilling of the entire lower half of the body has proved feasible in animals, with the aid of an abdominal tourniquet. The use of such a tourniquet, together with refrigeration, for uncontrolled post partum hemorrhage may therefore not be as formidable as it appears, and is evidently justified in cases otherwise hopeless.[21]

The preservative power of cold receives its severest test in cases of complete or nearly complete separation of parts from the body. The exceptional rules of temperature reduction for such isolated parts were mentioned at the outset, but if these parts are large or highly organized they cannot be preserved with the same impunity as simple grafts. The smallest part to be considered under the present topic is a finger which has been accidentally severed so that it hangs by only a tiny shred of skin. I had two such cases[22] and Kanaar another.[23] One of my patients was a 65-year-old laborer, who had his right thumb cut off at the interphalangeal joint. The plant doctor telephoned me and because I could not see the patient for more than three hours, he asked if I wished him to amputate proximal to the head of the proximal phalanx, as at that site he could cover the stump with skin. He was sure the distal fragment could not be saved. The doctor was advised to place the entire hand in a basin of snow-ice together with the part which was held by a thread of skin and instruct one of his nurses to keep it covered with ice at all times. It was four hours before I saw this man. The doctor was amazed that the parts remained fresh. During this interval, the patient was none the worse for the delay. The surgery was nothing more than what most doctors have performed in their offices; attempting as good an apposition and alignment as possible with no thought of blood vessel repair. The trauma had roughened the joint surfaces. Following the operation, chilling was continued by means of three ice bags. The palm of the hand rested on one and the others covered the back of the hand, wrist and lower forearm; twenty-four hours postoperative, the ice bag over the lower forearm was removed. The next day, the one on the back of the hand was taken off, and on the third day the use of the ice bag was discontinued and a small electric fan played on the part for twenty-four hours. The part healed kindly and the patient returned to his regular heavy work, the only kind of work he knew. Ankylosis at the interphalangeal joint proved to be no real handicap. This case illustrates just one thing: if the parts are kept cold, there is no great urgency. Too many "parts" have been thrown in the waste pail. This is an illustration not only of the preservation of tissue vitality with minimum nutrition, but also the healing and formation of blood vessels at reduced temperatures.

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‡Manufactured by the Therm-O-Rite Products Company, Buffalo, N. Y.

It will doubtless be considered a wildly imaginative suggestion that a human arm or leg amputated in some accident might be kept on ice for a day or two and then restored to position and function The idea already is past the imaginary stage The method of blood vessel grafts devised by Blakemore and collaborators finds its first clinical application in injuries involving loss of circulation in an extremity, often with considerable deficits in the vessels though the part remains attached by bone or other structures The repair of the blood vessels is the only requisite for saving such a part, and has been proved feasible

Since refrigerated legs of animals have survived total anemia for fifty four hours without thrombosis or loss of function[24] and rats' tails have similarly survived for ninety six hours,[25] the possibility of postponement of these repair operations for at least a few days is evident Especially is this true in view of the longer periods described under "delayed operations" The extreme step was taken by the Blakemore group when they amputated dogs' legs, stored them in the ice box for twenty four hours, and then successfully united them to the body The technique is far more difficult in dogs than in man so that, although this operation has not yet been performed in a human case, there is no reason why trials should not be made, even if the severed extremity must be refrigerated for one to several days before arrival at a suitably equipped hospital For the best results the operator must be more than a very good general surgeon, he must also be a clever blood vessel surgeon

What has been accomplished by refrigeration for anesthesia and for the preservation of traumatized tissues will, I think, be proved by time to be little compared with the possibilities to be in process of development Refrigeration cannot convert dead tissues into healthy structures but it does prevent the decomposition when almost all of the blood supply has been cut off According to the definition of death, all the skin, blood vessels and yes, the blood stored in the ice box, are "dead," yet they accomplish wonders when properly used in healthy tissues

Refrigeration never cures—it supports No splint ever healed a fracture No surgeon ever cured a patient The surgeon may be likened to a good football coach who studies ways and means of getting rid of the opponents' interference If the surgeon can rid the patient of the condition which is interfering with good health, the patient then "carries the ball "

Do not expect the impossible with any modality Richards of California reported an embolectomy which he said was poorly done The pulsation was not recovered Three days after the establishment of a line of demarcation, refrigeration was instituted and continued for three days before amputation Because the pathologist found the tissues decomposed Dr Richards decided that refrigeration was useless It had not prevented the death of the tissues The line of demarcation was positive proof that the blood supply to the part had been cut off During the next three days, at room temperatures, the tissues sloughed, so that before the application of low temperatures, the leg had spoiled If one places a rotten egg in the deep freeze, what he takes out at a later date will be a rotten egg

Begin the use of refrigeration before viability has been lost

SUMMARY

A series of conditions is described in which refrigeration of local tissues is valuable by reason of its unique power to control simultaneously pain, shock, exudation, infection, and tissue devitalization There is also occasional use for retarding toxic absorption, thereby gaining time for other treatments These uses are sometimes optional sometimes give improved results and sometimes are the one indispensable means of saving life and extremity For new applications, emphasis is placed on its value in the treatment of burns and for certain new developments in surgery

RÉSUMÉ

L'auteur decrit une serie de conditions dans lesque les la refrigération locale des tissus est de valeur, vu son pouvoir unique de contrôler simultanement la douleur, le choc, l'exudation, l'infection et la devitalisation des tissus Il y a aussi son emploi occasionnel pour retarder l'absorption toxique ainsi gagnant du temps pour d'autres traitements Ces emplois sont parfois facultatifs et parfois indispensables pour sauver la vie et l'extremite Pour de nou

velles applications, l'auteur place de l'emphase sur la valeur de cette méthode dans le traitement des brulures et pour certains nouveaux développements de la chirurgie.

ZUSAMMENFASSUNG

Es wird eine Reihe von Zustaenden beschrieben, in denen oertliche Gewebsabkuehlung auf Grund ihrer einzigartigen Faehigkeit, Schmerz, Shock, Exudation, Infektion und Gewebstod einzuschraenken, von Wert ist. Die Massnahme laesst sich auch gelegentlich anwenden, um die Absorption von Giftstoffen zu verzoegern und damit Zeit fuer weitere Behandlung zu gewinnen. Waehrend die Anwendung der Methode in manchen Faellen Sache der freien Wahl ist, stellt sie in anderen ein unentbehrliches Mittel zur Erhaltung des Lebens oder eines Gliedes dar. Was neuere Anwendungsformen betrifft, so wird der Wert des Verfahrens in der Behandlung von Brandwunden und in gewissen neu entwickelten Gebieten der Chirurgie hervorgehoben.

RIASSUNTO

L'A. descrive una serie di condizioni nelle quali la refrigerazione locale e' particolarmente utile per combattere nello stesso tempo dolore, shock, essudazione, infezione e devitalizzazione dei tessuti. La refrigerazione puo' essere anche adottata per ritardare l'assorbimento di tossine, dando con cio' maggior tempo per altri metodi di cura. Alcune indicazioni cliniche sono facoltative, altre indispensabili per la salvezza degli arti e per la vita stessa dei pazienti. L'A. sottolinea infine l'opportunita' di estendere l'uso della refrigerazione alla cufa delle ustioni, nonchè a taluni nuovi metodi chirurgici.

RESUMEN

Se describe una serie de estados en que es de importancia la refrigeración tisular local, en virtud de su extraordinario poder para controlar simultáneamente dolor, choque, exudación, infección y desvitalización tisular. Asimismo le uso ocasional para retardar la absorción tóxica, ganándose por consiguiente tiempo para otros tratamientos. Estos usos son algunas veces opcionales, algunas veces el solo medio indispensable para salvar vida y extremidad. Se señala su valor en el tratamiento de las quemaduras y ciertas manifestaciones quirúrgicas recientes.

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Case Report

Operative Excision of Giant Panniculus Adiposus

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MADISON, WISCONSIN

OPERATIONS for removal of excessive subcutaneous abdominal fat are described in most textbooks on plastic surgery. Such operations, as commonly practiced, are used to remove transverse rolls of adipose tissue, largely for cosmetic purposes.

The case to be presented here, however, is considered worthy of being recorded in the surgical literature because of the unusual extent and nature of the obesity, as well as the technical difficulties of the operative procedure.

Improvement in the patient's appearance was of secondary importance in the decision to operate. The risk of such an extensive procedure was accepted chiefly because of the degree of incapacity in an otherwise healthy, vigorous man.

Search of the literature has revealed only one other giant panniculus of comparable extent which was removed surgically. In 1939 Dr. Linton Smith of Atlanta, Georgia, reported a case in which a huge abdominal apron was removed successfully.

REPORT OF CASE

Mr. A. B., a 45 year old welder, was referred to the Jackson Clinic on Sept. 6, 1949, by his family physician, Dr. C. M. Frye of Rock Falls, Illinois.

The patient's chief complaint was of extreme obesity, in particular of a large apron of fat that hung down from his abdomen. Six years before admission he suffered a compound leg facture and was confined to bed for a number of months. During this time he gained weight very rapidly and reached a maximum of 700 pounds (350 Kg.). After recovery from his fracture he returned to work and was put on a strict reduction diet. Under this regimen his weight came down considerably and was stabilized at about 450 pounds (225 Kg.), which was his weight when he entered the Clinic. Although he had been working regularly at his job in the foundry, he had great difficulty in moving about. Several members of his family were extremely heavy and had a tendency to abnormal obesity, but none of them had ever shown a true *giant panniculus adiposus*.

Physical examination gave essentially negative results except for the unusual obesity. The heart and lungs were normal, the blood pressure in millimeters of mercury was 210 systolic and 150 diastolic. The obesity was of peculiar distribution. Th

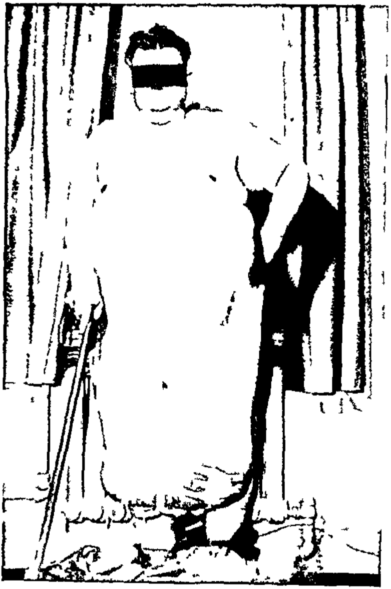

Fig. 1.—Mr. A. B., aged 45. Giant panniculus adiposus, front view.

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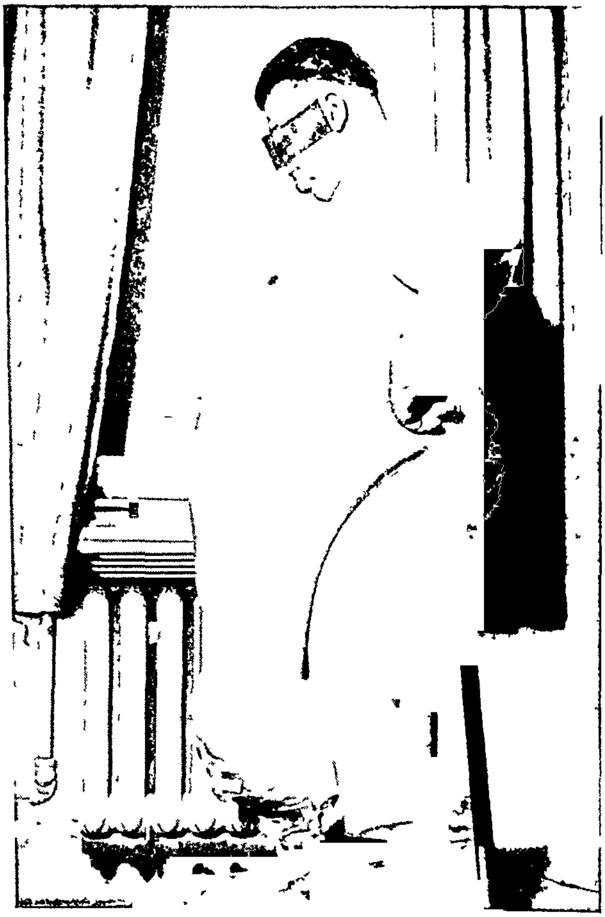

Fig. 2.—Same patient. Giant panniculus adiposus, lateral view.

face, neck, buttocks and extremities were not unusually heavy. The extreme adiposity was confined to the abdomen in the form of a huge fatty apron, measuring 3½ feet (106.7 cm.) across the base and 1½ feet (45.7 cm.) across the distal end and hanging to within a few inches of the ankles. The genitalia and the knees were completely hidden, and the umbilicus was displaced downward to the level of the midthigh. The skin of the lower third of the fatty apron was markedly edematous and cyanotic, and there were several small areas of superficial ulceration due to burns resulting from his occupation as a welder. The skin within the deep folds of the groin was excoriated and covered with rancid sebaceous material. The genitalia were normal in appearance.

Routine blood and urine examinations revealed no abnormality. Serologic studies were also noncontributory. The serum cholesterol was within normal limits, as was the urinary excretion of 17 ketosteroid. The fasting blood sugar level was 114 mg. per hundred cubic centimeters. The value for total serum protein was 6.8 Gm. with a slight increase in the globulin fraction. Routine roentgen examination of the chest showed a normal cardiac silhouette and normal lung fields. The electrocardiogram was normal. Singularly, the patient's basal metabolic rate was plus 41; this could have been accounted for by the fact that he had taken 2 grains of thyroid daily for two weeks before this test. There were no symptoms or signs of endocrine disturbance.

After considerable study, radical excision of the massive panniculus was thought to be feasible, and a date was set for operation. We knew that one of our greatest dangers would be that of infection in the operative wound. Consequently, the entire operative field was washed daily with G-11 soap and kept covered with sterile drapes for a week beforehand. The condition of the skin improved markedly. A full daily dose of penicillin was also given during preoperative and postoperative treatment.

Operation was performed on September 27. Since the regular operating table was much too narrow for the patient's bulk, he was placed on a standard hospital bed with a hard mattress, the bed being equipped with a Balkan frame. Satisfactory spinal anesthesia was obtained by the use of 15 mg. of nupercaine. In order to obtain physical control over the heavy panniculus, it was suspended from the Balkan frame. Two heavy steel pins were transfixed through the distal end of the apron, and the huge mass was elevated by a rope and pulley system. It could thus be raised, lowered or shifted with ease. This we considered one of the cardinal features that enabled us to carry out the extensive operation with facility. Instead of the ordinary small surgical scalpel, two large regular skinning knives were purchased and used.

The entire fatty apron was excised at its base by means of a transverse elliptic incision extending from flank to flank. Except for a small umbilical hernia, the musculature of the abdominal wall was intact. Numerous large veins were encountered, but there was little loss of blood, since elevation of the apron had drained the vascular bed. The umbilical hernia was repaired in the usual manner. The edges of the wound in the abdominal wall fell together without tension, and the incision was closed with multiple rows of chromic catgut sutures. The mass after removal and drainage of blood and serum weighed 53 pounds (26.5 Kg.), undoubtedly considerably less than *in vivo*.

Except for a temporary drop in blood pressure following induction of spinal anesthesia, the operation was well tolerated by the patient. He was supported by ephedrine, oxygen and 1,000 cc. of whole blood.

About four hours after the operation the patient again showed signs of shock and was given another transfusion, as well as several 2 cc. injections of lipoadrenal extract. The cause of this episode of collapse became apparent several days later, when it was discovered that the right half of the wound contained a hematoma with an estimated volume of 1,000 to 1,500 cc. of blood. In order to evacuate it, we found it necessary to open the right half of the incision. The left half of the wound healed by primary intention, but the other side became superficially infected with Bacillus pyocyaneus. The infection was treated with systemic streptomycin and local compresses of 0.5 per cent acetic acid. Healthy granulations quickly covered the surface of the defect, and the wound was allowed to fill in from the bottom. This progressed with remarkable speed and was 95 per cent healed within six weeks.

About two months after the operation the patient was able to go back to his regular work. He is now able to move around with considerably more freedom; he feels better, and is happy to be able to wear a regular suit of clothes instead of the outsized overalls which were his only clothing before the operation.

In spite of a strict 1,000-calory diet the patient has been unable to reduce beyond the 350 pounds (175 Kg.) he weighed when he left the hospital.

SUMMARY AND CONCLUSIONS

1. Modern preoperative preparation and therapy enabled the authors to remove a giant panniculus from a patient without undue danger or difficulty.
2. A possibly disastrous fulminating infection may be avoided by careful preoperative preparation of the skin and daily adequate administration of penicillin for at least a week before operation.
3. Elevation of the panniculus with a rope and pulley swung from a Balkan frame greatly facilitated surgical removal of the apron.
4. More careful hemostasis during the operation could have prevented the huge hematoma which delayed healing and closure of the wound.

RÉSUMÉ

1. La methode préoperatoire moderne et la thérapie permirent aux auteurs de faire l'ablation d'un pannicule géant chez unmalade, sans danger et sans difficultes
2. Une infection fulminante désastreuse possible peut être évitee par la préparation préoperatoire soignée de la peau du malade et par l'administration adéquate quotidienne de penicilline pour environ une semaine avant l'opération
3 L'élévation du pannicule à l'aide de corde et de poulie facilitat beaucoup l'ablation chirurgicale.
4. Une hémostase plus soignée au cours de l'opération aurait empêché un hématome volumineux qui retardat la guérison et la fermeture de la plaie.

RESUMEN Y CONCLUSIONES

1. La preparación preoperatoria y terapéutica modernas facilitaron a los autores la extirpación de un gran paníeulo sin peligro o dificultad.

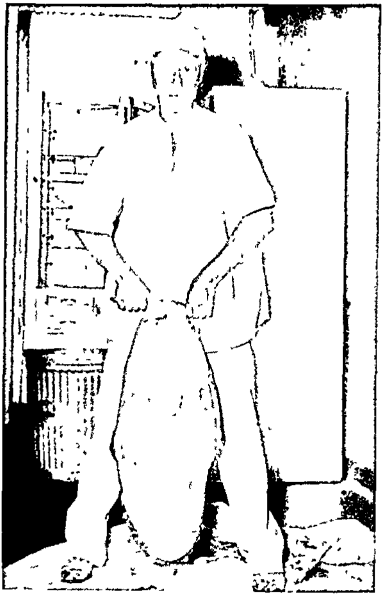

Fig. 3.—Giant panniculus adiposus after surgical removal. The mass weighed 53 pounds (26.5 Kg.).

2. Puede evitarse una infección fulminante, posiblemente desastrosa, por la cuidadosa preparación preoperatoria de la piel y la administración adecuada de penicilina, diariamente y cuando menos por una semana antes de la operación.
3. La elevación del panículo con cuerda y polea movidas en un cuadro Balcán facilitan grandemente su extirpación quirúrgica.
4. La hemostasia peroperatoria muy cuidadosa puede prevenir el gran hematoma que retarda la cicatrización y cierre de la herida.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Die Anwendung moderner praeoperativer Vorbereitungs- und Behandlungsmethoden hat es den Verfassern ermoeglicht, das riesige Fettpolster eines Kranken ohne ungebuehrliche Gefahr oder Schwierigkeiten zu entfernen.
2. Die Moeglichkeit einer heftigen katastrophalen Infektion kann durch sorgfaeltige praeoperative Vorbereitung der Haut und durch die Verabfolgung angemessener taeglicher Dosen von Penizillin mindestens eine Woche lang vor der Operation vermieden werden.
3. Das Hochheben des Fettpolsters mit Hilfe eines Seiles und eines ueber einen Bettrahmen geschwungenen Zuges trug erheblich zur Erleichterung der Resektion bei.
4. Ein grosser Bluterguss, der die Heilung und die Schliessung der Wunde verzoegerte, haette durch eine sorgfaeltigere Blutstillung waehrend der Operation verhuetet werden koennen.

RIASSUNTO

1. Preparazione e terapia moderna preoperativo permettano gl'autori di sollevare d'un paziente un panniculo gigantesco senza pericolo o difficoltà.
2. Infezione fulminante e disastroso si evita per mezzo di preparazione vigilante pre operativo della pelle, e l'amministrazione giornalmente di Penicillin sufficiente per almeno una settimana in anticipo della chirurgia.
3. Elevazione del panniculo a fune e carrucola sospeso dell 'armature Balkan facilità l'eccizione.
4. Piu attento al emostasi durante l'operazione per prevenire l'ematoma immenso che ritardo' la guarigione e chisura della ferita.

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If a man feels that his life is wonderful, and if he is reflective withal, he wishes to make a record in order more fully to realize and preserve it. So Pepys overflowed with wonder and delight that he should be a part of these great events, "himself not least but honored of them all." And no doubt he loved to reread it. "A man," said Doctor Johnson, "loves to review his own mind."—*Charles Horton Cooley*

New Anatomic Rings

PEDRO D CURUTCHET, M D, F I C S*
BUENOS AIRES

FIG 1 represents a Hegar Mayo surgical needle holder with Dr Pedro D Curutchet's anatomic rings The broad and beveled anatomic rings constructed according to digital anatomic specifications, are comfortable and do not tire the fingers The contact surface, tactile and kinestatic, is three times as large as the ordinary one (Fig 2) All this makes the pressure comfortable, secure and precise for the benefit of suturing The broad and beveled anatomic rings allow one to take the instrument and to put it aside with the greatest ease This model was constructed for my own left hand

It is for the benefit of surgical technic that I wish to publicize *the principle of anatomic rings* for all such instruments as hemostatic forceps, intestinal forceps, shears, clamps, etc This modification will neither complicate the instrument nor make its production more expensive It will not increase either the volume or the weight of the instrument It has no influence on the length and does not alter the shape It is an easy but effective modification

Although surgeons have hitherto been mainly interested in the basic mechanics of each instrument and its specific application the principle of these anatomic rings is a general one and is aimed toward improvement of current operative technics The rings represent a correction of the unacceptable rings of the usual forceps and shears, which make movements tiresome and difficult and impede their precision It was not intended to create a specific and personal instrument but to offer an improvement and to eliminate a great inconvenience I have found that, wherever explained, it attracts the immediate interest of every surgeon

INSTRUMENTS AUX ANNEAUX ANATOMIQUES

La Fig 1 répresente un porte aiguilles de Hegar Mayo avec des anneaux anatomiques

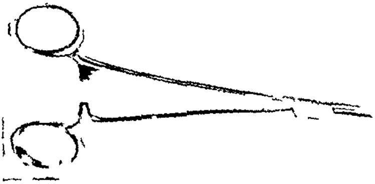

Fig 1—Needle holder with author's anatomic rings

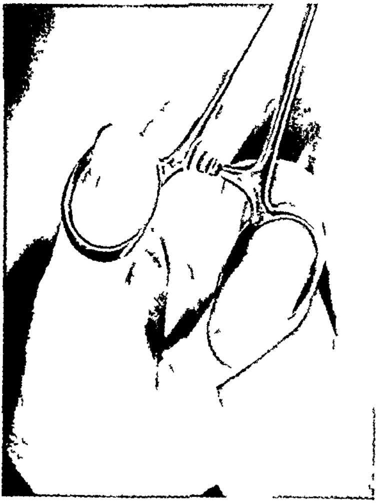

Fig 2—Anatomic adaptation and the surface contact with surgeon's fingers are improvements over [illegible] gs

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*Titular member for the Argentine Chapter International College of Surgeons

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du Docteur Pedro D. Curutchet. Ces anneaux anatomiques, larges et biseautés suivant les exigences d'anatomie digitale, ne gênent pas et ne fatiguent pas les doigts. La surface en contact, tactile et kinéstétique est trois fois plus grande que celle d'un anneau commun (Fig. 2). Et c'est pour celà qu'elle nous donne une *pression commode, sure et précise* au profit de la suture.

Ces anneaux, larges et biseautés nous permettent de prendre et de remettre les instruments avec la plus grande facilité. Ce modele-ci est pour la main gauche de l'auteur. C'est au profit de la téchnique d'opérer que *l'auteur propose de généraliser le principe des anneaux anatomiques* et de l'adapter a tous les instruments comme pinces hémostatiques, pinces intestinales, ciseaux, clambs, etc. Cette modification ne fait pas la production plus chère et ne la complique pas. Elle n'augmente ni le volume ni le prix d'instrument et ne change pas sa longueur et sa forme. C'est une modification simple et efficace. Jusqu'à présent la chirurgie ne s'intéressait qu'à l'usage mécanique et immédiat de chaque instrument dans son application spécifique. Le principe des anneaux anatomiques n'est pas spécifique et son but est d'améliorer la téchnique présente. Plus qu'une invention les anneaux anatomiques constituent une correction des anneaux inacceptables de nos pinces et siceaux que fatiguent et gênent les doigts et rendent l'exécution et la précision des mouvements plus difficiles. Grâce a son usage géneral et son élimination d'un important inconvénient ces anneaux sont de grand intérêt pour les chirurgiens.

INSTRUMENTOS DE ANILLOS ANATÓMICOS

La Fig. 1, muestra un porta-agujas de Hegar-Mayo con los anillos anatómicos del Dr. Pedro D. Curutchet.

Los anillos anatómicos, anchos y biselados, de acuerdo a la anatomía digital, no molestan ni fatigan los dedos; la superficie de contacto, tactil y kinestésica, es tres veces mayor que la del anillo común (Fig. 2). Por todo ello, *proporciona una prension cómoda, segura y precisa*, en favor de la sutura. Los anillos anchos y biselados permiten tomar y dejar el instrumento con facilidad.

El presente modelo es para la mano izquierda del autor.

En positivo beneficio de la técnica operatoria, *el autor propone generalizar el principio de los anillos anatómicos* a todos los instrumentos similares: pinzas hemostáticas, pinzas intestinales, tijeras, clambs, etc. Esta modificación no complicaría ni encareceria la fabricación. Tampoco aumenta el volumen ni el peso de los instrumentos, ni modifica la longitud ni la forma de las ramas de dichos instrumentos.

Es una modificación simple y eficaz, sinembargo, hasta ahora, la cirugía se ha interesado exclusivamente por las necesidades mecánicas inmediatas que cada instrumento ha debido cumplir en su aplicación específica. Precisamente, el principio de los anillos anatómicos, no es específico, sino general y por tanto, fecundo en el mejoramiento de la técnica. Mas que una invención, estos anillos anatómicos vienen a ser una corrección de los inaceptables anillos de nuestras pinzas y tijeras que molestan los dedos, dificultan y contrarían la ejecución y presición de los movimientos.

Quizá por esto mismo, por no haber ambicionado crear un instrumento personal, sino haber procurado subsanar un importante inconveniente de los instrumentos mas comunes, esta modificación de los anillos pueda atraer la atención de los cirujanos.

STRUMENTI DI ANELLI ANATOMICI

La Fig. 1 rappresenta un porta-ago Hegar-Mayo con gli anelli anatomici del Dott. Pietro D. Curutchet.

Gli anelli anatomici, larghi e bisellati d'accordo alla anatomía digitale, non molestano, ne stancano le dita; la superficie di contatto, tattile e chinestésica, é tre volte piú grande di quella dell'anello comune (Fig. 2). Per tutto ció, *proporziona una pressione* comoda, sicura e precisa, a favore della sutura. Gli anelli larghi e bisellati permettono prendere e lasciare lo strumento con facilitá.

Il presente modello é per la mano sinistra dell'autore.

Nel positivo benefizio della tecnica operatoria, *l'autore propone generalizzare il principio degli anelli anatomici* a tutti gli strumenti affini, pinze emostatiche, pinze intesti-

nali, forbici, clambs, ecc Questa modifica non complicherebbe, ne rincarirebbe la construzione Il peso ed il volume degli strumenti non aumenta neanche, ne modificano la longitudine né la forma dei rami di detti strumenti Trattasi di una modificazione semplice ed afficace ció nonostante, la chirurgia fin'ora si é interessata esclusivamente delle necessitá meccaniche immediate che ogni strumento ha dovuto riunire nella sua specifica applicazione

Precisamente il principio degli anelli anatomici, non é specifico bensí generale eppercio fecondo nel miglioramento della tecnica Piu che una invenzione, questi anelli anatomici rappresentano una correzione degli inaccettabili anelli delle nostre binze e forbici che molestano le dita, difficoltano e contrariano la asecuzione e precisione dei movimenti Forse, perció, per non aver ambito di creare uno strumento personale, bensi aver intentato rimediare un importante inconveniente negli strumenti piú comuni, questa modifica degli anelli, puo attrarre l'interesse dei chirurghi

NEUE ANATOMISCHE INSTRUMENTENGRIFFE

Fig 1 stellt einen Hegar Mayoschen chirurgischen Nadelhalter mit Dr Pedro D Curutchets anatomischen Griffen dar Die breiten abgeschraegten, nach fingeranatomischen Angaben angefertigten Griffe sind bequem und ermueden die Finger nicht Die fuehlbare und Bewegungskontrolle zulassende Kontaktflaeche ist drei mal so breit wie im allgemeinen ueblich (Fig 2) Dies alles ermoeglicht die Ausuebung eines bequemen, sicheren und genauen Druckes bei der Anglegung der Naht Die breiten und abgeschraegten anatomischen Ringe gestatten ein leichtes Ergreifen und Ablegen des Instruments Das vorliegende Modell ist fuer meine eigene linke Hand angefertigt worden

Im Interesse der chirurgischen Technik moechte ich das Prinzip der anatomischen Griffe fuer alle derartigen Instrumente wie haemostatische Pinzetten, Darn pinzetten Scheren, Klemmen usw bekannt geben Eine solche Abaenderung macht die Instrumente nicht komplizierter und erhoeht nicht die Herstellungskosten Das Instrument gewinnt weder an Umfang noch an Gewicht Seine Laenge und seine Form aendern sich nicht Es handelt sich um eine einfache aber wirksame Modifikation

Waehrend sich die Chirurgen bisher im wesentlichen fuer die mechanischen Grundlagen jedes einzelnen Instruments und deren spezifische Anwendung interessiert haben, so handelt es sich hier im Falle der anatomischen Griffe um ein allgemeines Prinzip, das auf die Verbesserung der heutigen Operationstechnik gerichtet ist

Diese Griffe stellen eine Verbesserung der unmoeglichen Ringe an den gebraeuchlichen Pinzetten und Scheren dar, welche die Bewegungen schwierig und ermuedend machen und einer praezisen Anwendung hinderlich sind Es bestand nicht die Absicht, ein spezifisches und persoenliches Instrument zu schaffen, sondern vielmehr eine Verbesserung einzufuehren und eine grosse Unbequemlichkeit auszuschalten Ich habe die Erfahrung gemacht, dass dieser Vorschlag, wo immer vorgetragen, das unmittelbare Interesse jedes Chirurgen erweckt

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Turkish Chapter Meeting

The Turkish Chapter of the International College of Surgeons will hold the first of its scientific meetings on January 27, 1951, in Istanbul, under the direction of the President of the Chapter, Prof Dr Burhaneddin Toker and the Secretary, Dr Dervis Manizade Three such sessions will be held during the year

Sección en Español

Un Nuevo Método de Prevenir el Émbolo Mortal

HARRY H. McCARTHY, M.D., F.I.C.S., LOUIS D. McGUIRE. M.D., F.I.C.S.,
ARTHUR C. JOHNSON, M.D., F.A.C.S., JOHN W. GATEWOOD, M.D., F.A.C.S.
OMAHA, NEBRASKA

PARECE casi increíble que la cirugía haya hecho tan grandes avances en conquistar los obstáculos que fueron responsables por una crecida mortalidad quirúrgica y que aún haya fracasado completamente en dominar el émbolo mortal. El Doctor Arthur W. Allen[1] del Hospital General de Massachusetts, en julio de mil novecientos cuarenta y nueve dió cuenta de que tantos émbolos mortales ocurrieron en el último año como en diez años pasados. Oschner[2] informó de una tendencia similar—en realidad sus cifras mostraron un aumento constante en los casos del tromboembólia y de los émbolos pulmonares y mortales La ligación de las venas y terapéutica anticoagulante indubablemente han prevenido la muerte en muchos casos (especialmente en los que se ha dado advertencia por el émbolo no mortal.) La ligación profiláctica de las venas ha sido un fracaso completo, pues tantos pacientes mueren de los émbolos mortales después de la ligación como los que mueren sin ella. El levantarse pronto de la cama ha disminuído los casos de complicaciones post-operatorios, que son en su mayoría respiratorios y ciertos cardíacovasculares, mas en general no han decrecido esencialmente los casos de los émbolos pulmonares y mortales. Se ha hecho mucho para la posibilidad de pronosticar cuales pacientes son propensos al desarrollo de lesiones tromboembolías. Las obras de Oschner y Kay tocante a la concentración de globulina y los estudios de Takats[4] Sandrock y Mahoney[5] y otros, han ofrecido grandes avances en el desenvolvimiento de algún método de separar de los demás, a aquellos que serían víctimas de tales accidentes.

Una dificultad de seriedad reside en el hecho de que no hay manera de presagiar la muerte inminente por un émbolo. Verdaderamente, no hay uniformidad de opinión sobre el origen de tal émbolo. Los autores creemos que si es verdad que la mayoría de los émbolos provienen de trombos en las piernas, entonces algún método de determinar la presencia o ausencia de un trombo en esta situación sería de sumo valor. Los autores, en la actualidad estamos llevando a cabo estudios en que hacemos uso de células rojas señaladas para determinar la presencia o ausencia de trombos post-operatorios en las venas situadas profundamente en las piernas. Las células rojas que se administran al paciente antes de la cirugía están incubadas con P 32 (fósforo indicado). Puesto que la mitad de la vida del P 32 es de catorce días, hay tiempo adecuado para determinar el cuento Geiger en las pantorillas. Esto se hace antes y después y de la cirugía y antes y después de usar el Neumático Circulador.

No hay duda de que el mayor número de los trombos ocurre en las venas situadas profundamente en las piernas. Es hecho aceptado que aproximadamente el noventa por ciento de los émbolos pulmonares se asocian con los trombos en las venas de las piernas Hay tantos elementos variables, que ha sido difícil probar que estos trombos representan un papel mayor en los émbolos pulmonares. Asimismo hay divergencia de opinión en cuanto al origen de los trombos. Parece improbable que éstos resulten como ocurrencia natural de muerte. Los autores creemos que presión hecha por medio de la *isquemia* en las pantorrillas, especialmente durante procedimientos de operación y en la fase de recobro post-operatorio durante el tiempo que hay ausencia de tono muscular, representa gran importancia en la etapa inicial de la enfermedad Teniendo esto en cuenta, y las razones que apoyan tal contención, las cuales se enumerarán más tarde en este tema, los autores hemos ideado un método para prevenir la isquemia por presión y al mismo tiempo proveer artificialmente la continuación de activ-

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From the Department of Surgery, Faculty of Medicine, Creighton University

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idad muscular durante un procedimiento de operación El aparato usado para efectuar tal actividad muscular será descrito más tarde en este tema

El crecido número de trombos ocurre en las venas situadas profundamente en las piernas, lo que se asocia con los émbolos no mortales y los émbolos mortales apenas puede ser una coincidencia Los rasgos siguientes parecen apoyar esta idea

1 Ocurre crecido número de émbolos pulmonares y mortales en pacientes que han sido operados mientras estaban postrados en posición supina, especialmente en operaciones de larga duración y particularmente en las que se requería la posición Trendelenburg Datos estadísticos por Barker, Hines y Allen[6] en los cuales señalan los casos de émbolos pulmonares y mortales, prestan peso a esta teoría, a pesar de que fueron publicados estos por otras razones Ocurre gran número de émbolos pulmonares y mortales en largos procedimientos quirúrgicos,—tales como los de operaciones radicales del pélvico, los de operaciones de las mamas y los de resección del estómago, los cuales se hacen en las posición supina, mientras es menor el número de casos que se dan en las operaciones de corta duración—particularmente en las que se hacen con anestesia local, es decir, las operaciones de tiroides, y ciertas neuroquirúrgicas, etc

2 En los pacientes que son intervenidos de ambas hernias femorales, los émbolos pulmonares resultan en 50% más de los casos que si se interviniese solamente uno de los lados Lo mismo sucede cuando se interviene una o dos de las hernias inguinales El único rasgo variable es el espacio de tiempo

3 Son menores los casos que se dan de émbolos pulmonares en cirugía pediátrica Mas actividad, corto período de operación y peso disminuido de las pantorrillas—estos son elementos que tienden a decrecer la presión isquémica

4 Los casos de émbolos pulmonares aumenta marcadamente en procedimientos operatorios en pacientes que pesan más de 200 libras

5 Se dan menos casos de émbolos pulmonares en procedimientos en los que el paciente reposa en una posición lateral durante una operación

6 Puesto que no hay suficientes cifras disponibles para comprobar lo siguiente, los autores somos de la opinión que hay mayor número de émbolos pulmonares post-operatorios en los casos de cirugía torácica en que el procedimiento se hace con el paciente postrado lateralmente Creemos lo contrario en los casos donde los pacientes reposan en posicion supina

El retroceso de sangre por las venas al corazón depende de (*1*) presión negativa dentro del tórax, (*2*) gravedad, (*3*) actividad muscular, (*4*) la ausencia de un obstáculo mecánico que evite el retroceso de la sangre A menudo uno o más de estos elementos se alteran durante un procedimiento operatorio El que más comunmente se impide es el de la actividad muscular, lo que ocurre como resultado de anestesia profundamente aplicada La pérdida de tono muscular puede ser debido a la anestesia regional o general y la ausencia de tono puede perdurar por un período de tiempo variable Nosotros creemos que si se pudiera estimular la actividad muscular normal y que si al mismo tiempo se pudiera remover la presión isquémica durante e inmediatamente después de un procedimiento operatorio, bien se podría prevenir el principal elemento etiológico que da principio al émbolo que marcha en misión de dar muerte al paciente Se ha ideado un aparato para continuamente contraer y aflojar la musculatura de las pantorrillas y así liberarlas de la prensadura contra la mesa de operaciones Una descripción de este aparato se ha dado previamente

“El aparato siguiente fué diseñado para evitar prensadura prolongada con resultado de isquemia y para también producir los movimientos de compresión y aflojamiento que ayudan a la circulación en las piernas Fué diseñado para funcionar simplemente, sin ruído, y automáticamente de tal manera que no sea molesto a nadie en la sala de operaciones Igualmente fué diseñado para prescindir de motores y así minorar el peligro de encender gases explosivos El aparato consiste en una vejiga de goma que se infla y que está construida para quedar a la forma del pie y de la pierna hasta llegar a la fosa poplítea La vejiga
es bastante grande para n una pierna
obesa o simplemente do se
en una extremidad rtimi

tos anteriores y posteriores amoldables al pie se relacional directamente con los compartmientos amoldables a la pierna por medio de un pequeño canal de aire.

El aparato fué diseñado así por dos razones: (*a*) para ayudar a la libre circulación de aire evitando angulación y desgaste en el sitio donde se amolda al talón; (*b*) para permitir el uso de tobilleras de sujeción en vez de un cinto más superior a las rodillas. Todos los compartimientos de ambas vejigas de ahí se relacionan por medio de un mecánismo pequeño. Este es de forma cilíndrica y mide 18 por 12 por 4 centímetros. El aire entra en el aparato de un tanque que contiene aire comprensado. Cuando el émbolo del cilindro llega a cierto punto una válvula permite el escape del aire. Esto produce "la expiración" del ciclo. "La inspiración" del ciclo ocurre cuando el émbolo del cilindro se mueve en la dirección opuesta. El número de ciclos que se efectua por minuto se puede regular facilmente por medio de una pequeña válvula situada en el extremo distante del cilindro o también por regular la cantidad de aire que entra en el aparato. No es necesario que haya muchos ciclos o recorridos, puesto que el própósito de este aparato es el de causar compresión y aflojamiento artificial de los músculos solamente tantas veces como sea necesario para prevenir éstasis de la sangre y presión isquemica. Hemos encontrado que un litro de aire por minuto produce aproximadamente 3 recorridos por minuto. Se necesita solamente una poca cantidad de aire. Los accesorios que se requieren son adecuados para cualquiera de los reguladores de tanques de oxígeno que se usan por lo común. La enfermera que atiende de la circulación es la persona más propicia para superentender el mecánismo, cuando éste ya se haya fijado a las extremidades del paciente. Después de esto, el aparato requiere poco o nada de cuidado. Nosotros creemos que este aparato es la solución para prevenir los émbolos pulmonares."

COMENTARIO

Varios elementos importantes fueron considerados en diseñar un aparato para remover prensadura y estimular la actividad muscular. He aquí los siguientes:

1. La presión debe ser eliminada de las pantorrillas.
2. Puesto que esto sea posible por usar varios aparatos de suspensión, un método debe utilizarse que produzca los movimientos de contracción y aflojamiento en las pantorrillas. Esto debe consistir simplemente en presión positiva y aflojamiento de retroceso en vez de succión o presión negativa. La presión negativa provoca la varicositis.
3. El aparato o la medida debe ser económica, y debe requerir poca o nada de atención.
4. Debe ser simple de construcción y sin motores electricos y el peligro de chispas que sean causadas por fricción; así se evita el peligro de encender gases explosivos.
5. Su actividad continua por largo tiempo no debe ser dañosa a los tejidos de la pierna.
6. El método o aparato debe aplicarse a la parte del cuerpo que es más propenso al desarrollo de los trombos.

Aunque en la actualidad no hay suficientes cifras disponibles, más del 70% de las complicaciones ocurre cuando no se emplea el Neumático Circulador.

CONCLUSIÓN

1. No se ha disminuido los casos de los émbolos pulmonares y mortales durante varias decadas pasadas.
2. Casi en total han fracasado los métodos empleados para evitar el émbolo mortal.
3. Un ensayo simple se está empleando para determinar la presencia o ausencia de trombos en las piernas después de la operación.
4. Un método previamente presentado se ha demostrado fructuoso en disminuir los casos de los émbolos pulmonares y mortales.

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Editorial

Membership in the United States Chapter of the International College of Surgeons

The second half of the twentieth century opens upon a period of great promise in the history of the International College of Surgeons Never before has there been so strong and all pervading an interest in the fulfilment of College ideals and the world wide extension of College membership and facilities A natural corollary of this interest is a quickening of desire for membership in the organization, and many questions arise concerning membership qualifications and the practical ways and means by which the College strives to perfect its achievements

It is thought both fitting and expedient, therefore, to provide in this first issue of the *Journal* for the New Year a summary of membership requirements and a brief explanation of the processes involved in admission and certification in the United States Chapter, all of whose policies are, of course, established in harmony with the internationally basic principles upon which the College is founded

Certification for Fellowship in the International College of Surgeons is based on an impartial determination of the candidate's qualifications, both personal and professional In this country it is granted by authority of the International Board of Surgery of the United States Chapter There are two ways in which an eligible candidate may become a Certified Fellow (*a*) by a record of distinguished merit and (*b*) by examination

To be eligible for Certified Fellowship in the United States chapter by merit, the candidate must be a citizen of the United States, a graduate of a medical school recognized by the Council of Medical Schools and Hospitals of the American Medical Association, a member of the American Medical Association and of the state and county medical societies, and a person of unimpeachable repute from the point of view of morality and professional ethics He must have practiced surgery as a specialty, with distinction, for ten or more years Fellowship in other surgical organizations or certification and/or membership of other certification boards will be evaluated and credited but do not obligate certification by the International College of Surgeons

In other words, certification by merit is available to those whose records of achievement are such as to eliminate the necessity of examination The need of a certain flexibility in this respect, strictly within the limits of the organization's high professional standards, early became apparent and was duly met by this form of certification It was devised to fulfil an important need for those men who have already proved their value and as a formal recognition of their outstanding achievements in the field

Eligibility for certification by examination includes all the requirements aforementioned (except the ten year record) and the following additional requirements

1 Completion of an internship of not less than one year in a hospital approved by the Council on Medical Education and Hospitals of the American Medical Association

2 Surgical training of not less than three years in addition to his internship This period of training may be spent (*a*) as a resident in surgery in a hospital approved by the Council of Medical Education and Hospitals of the American Medical Association, (*b*) under the preceptorship and/or direct supervision of a surgeon acceptable to the International Board of Surgery Up to one year of this training may be in the basic medical sciences, or it may

consist of postgraduate study provided this covers the full academic year.

3. Submission of a properly compiled list of his scientific publications, accompanied with reprints if possible.

4. Submission of a complete record of all surgical procedures performed by him for at least one year prior to his application for Certified Fellowship.

5. Evidence that he has limited his practice to surgery or a surgical specialty for at least three years.

The *examination* for certification in surgery and its specialties includes (1) written and oral tests in the principles and practice of surgery, with emphasis on the subdivision or specialty professed by the candidate, and (2) examination in anatomy, physiology and gross and microscopic pathology, with emphasis on the clinical application of these sciences.

The *qualifying examination* is divided into Part I (written) and Part II (clinical). A card of admission is forwarded in advance from the Office of the Secretary, attesting that the candidate has given satisfactory evidence of all the prerequisites hereintofore listed, together with a notice of the date, place and hours of the examination, which covers a period of two days, with morning and afternoon sessions of three hours each.

All candidates wishing to qualify as Certified Fellows pay an application fee of one hundred dollars and a certification fee of twenty-five dollars.

Candidates recommended for certification by examination pay an additional examination fee of seventy-five dollars before taking the examination, and, if successful, the usual certification fee. The diploma fee is ten dollars, payable on notice of election. A Fellow's annual dues are twenty-five dollars per year, payable on January 1.

All payments are made by check payable to the order of the International Board of Surgery, United States Chapter, International College of Surgeons. Examination fees are refunded to candidates who for any reason do not take the examination as planned, but not in case of failure. A candidate who fails in the examination may apply for reexamination.

Recipients of certification by the Board are entitled to use the designation "Diplomate of the International Board of Surgery."

Any certificate so issued is subject to revocation by the Board if the candidate is proved guilty of misrepresentation of facts on his application or has become disqualified since its receipt through violation of the code of ethics of the American Medical Association.

Eligible candidates desiring to apply for examination may obtain the appropriate form by communicating with Dr. Karl A. Meyer, Secretary of the International Board of Surgery of the International College of Surgeons, United States Chapter, 1516 Lake Shore Drive, Chicago 10, Illinois.

Associateship and Junior Membership.—These two ranks of membership in the International College of Surgeons are two more examples of recognition of the need of flexibility to extend opportunity to those not yet ready for the rank of Certified Fellow.

Candidates for the class of Associate must be graduates of duly accredited medical schools or universities, must have served their internships and residencies or the equivalent in their several specialties, and must be of unimpeachable moral character. Both their qualifications and their professional records must be vouched for by at least two Fellows of the College or by three reputable surgeons in their respective communities. Every candidate for Associateship must be a member of the American Medical Association. Fellowship or certification in other surgical organizations is duly recognized and evaluated but, here again, in no way makes mandatory the candidate's admission to the United States Chapter of the International College of Surgeons.

The candidate for Associateship must submit a full copy of the records and hospital numbers of patients operated on by him during the year preceding his application. Reprints of any papers he has published should also be presented. The application fee for Associateship is one hundred dollars.

All Associates of the United States Chapter of the International College of Surgeons are expected to attend the annual Convocation. No diploma is granted to Associates, but an identification card is issued. Every Associate is expected, within five years of his election, to have made sufficient progress in surgery to qualify him to apply to the International Board of Surgery for advancement to Fellowship in the organization.

The annual dues of the Associate are twenty-five dollars per year, payable on January 1.

Junior Membership, established to broaden the opportunities of deserving younger surgeons, is based upon the following requirements:

1. The candidate must be an American citizen and a graduate of a school of medicine approved by *the American Medical Association.*
2. He must have served one year's internship in a hospital approved for the training of interns and must present a letter from the Medical Director of the same.
3. He must be ethically, morally and professionally qualified for Junior Membership in the College.
4. He must show evidence of a surgical training program consisting of a minimum of two years' residency in surgery, or its equivalent, in addition to his year of internship.
5. He must submit a list of the operations he has performed or at which he has assisted.
6. His application for Junior Membership must be accompanied by a résumé of his professional training, two letters of reference and an application fee of five dollars.
7. On becoming eligible, the Junior Member is expected to make application for advancement to the International Board of Surgery.

No diploma is granted in connection with Junior Membership but an identification card is supplied to each accepted member. The annual dues of the Junior Member are five dollars.

The doors of the International College of Surgeons are wide open, as they have been from the hour of its foundation, to any qualified ethical surgeon who desires membership and can meet the organization's standards of character and skill. There is no distinction on any other basis; equal opportunity is offered regardless of race, creed and national origin. The very nature of the organization is a living denial of prejudice, a perpetual challenge to the enemies of scientific freedom and a powerful deterrent to all influences that tend to cripple scientific education and the interchange of enlightened thought.—*Arnold S. Jackson.*

THE ITALIAN CHAPTER OF THE INTERNATIONAL COLLEGE OF SURGEONS WILL HOLD ITS ANNUAL ASSEMBLY IN FLORENCE, ITALY

MAY 4 and 5, 1951

President of the Italian Chapter: Prof. Dr. Luigi Torraca, Professor of Clinical Surgery, University of Naples.

President of the Assembly: Prof. Dr. Antonio Comolli, Professor of Clinical Surgery, University of Florence.

Secretary of the Assembly: Prof. Dr. Gaetano Mangione, Assistant Professor of Clinical Surgery, University of Florence.

For complete information concerning the Assembly, please address the International Secretary General, 1516 Lake Shore Drive, Chicago 10, Illinois.

New Horizons

By the Editor

On Being Shelved

Webster defines a shelf as "a thin, flat, usually long and narrow piece of wood or other material, fastened horizontally at a distance from the floor, to hold objects." Other lexicographers agree, in all essentials, with this definition. Nor have we any fault whatever to find with it as it stands. Our objection is to certain proposed amendments, chiefly that which defines a shelf—tacitly, to be sure, but none the less insistently—as a repository for able and active men who, having reached an honorable maturity, are automatically to be retired in order to relieve their juniors of sharing the limelight with them.

This type of shelf, like its worthier predecessor, is thin and flat. It is not usually long and narrow but *un*usually long and narrow; its proportions, in fact, are unpleasantly suggestive of a sarcophagus. It also is fastened horizontally at a distance from the floor—in this case the floor of the arena; and its purpose, again, is to hold "objects." But there is a serious fault in its construction: It is not big enough to hold the "objects" for which it is designed. An able and active man consigned to a shelf is apt to prove a bit larger and livelier than the consignors anticipate. He is always leaping down again with an agility astounding in one of his age; and still more surprisingly he is often able to accomplish a good deal before he can be corralled and returned to the storeroom.

America, a young country, has always emphasized youth. But it is a mistake to emphasize anything without first defining it. Youth alone, chronologically speaking, is neither good nor bad; it is a purely arbitrary designation, invented for statistical convenience and classification. Any value inherent in youth must lie in some attribute peculiar thereto—freshness, curiosity, energy, glowing health, open-mindedness, courage or invention. All these qualities are often associated with youth, but by no means invariably. All these qualities are popularly supposed to decline with advancing years, but anyone with eyes in his head can see that they do not always do so. On the contrary, in many instances they go on burgeoning and spreading like the branches of an apple tree in spring, and the fruit grows richer and more plentiful every year. To accuse the tree of "dry rot" and cut it down is the act of a fool, and an extremely short-sighted fool at that. We may thank our stars that good men are hard to shelve, for, with so many capable juniors liable to the hazards of military service, the professional ranks at home would be dangerously thinned without the veteran campaigners of many years' experience.

No self-repsecting surgeon would continue in practice if he knew himself incapacitated in any way. The interest of too many others is involved. And shall a surgeon, accustomed all his adult life to facing the grimmest of realities, not be aware that virtue has gone out of him? He will be the first to know when it happens, and he will face that tragedy with the same outwardly cool though inwardly agonized resolution that has seen him through so many crises before. There will be no need of officious or ambitious hands to "shelve" him.

It is hardly worth while, perhaps, to point out the transparent self-interest and stupidity of trying to discredit the achievements of maturity on the single ground of maturity itself; persons capable of the attempt cannot see half an inch beyond their noses, or they would not be guilty of it in the first place. It is grimly amusing to see them reverse the charges as they themselves approach the danger line. Then their talk is all of the ineptitude of youth, its emptiness, its recklessness, its folly; and forthwith they set about, with all the energy of their earlier crusade, to put youth in its place and make it as difficult as possible for a youngster to get his foot on the ladder.

Fortunately, however, this preposterous blend of opportunism, self-interest and ill-directed ambition has not much power. In the first place, Heaven be thanked, most professional men are above it; in the second place, we repeat, retiring those who are not ready to retire is a good deal harder than it looks. Ability is not a matter of age, and this suffering planet is still able to accommodate more than it is likely to get.

Chapter News

Meeting of the House of Delegates
United States Chapter
International College of Surgeons

ARNOLD S JACKSON, M D, F A C S, F I C S
SECRETARY, UNITED STATES CHAPTER

The meeting of the House of Delegates* of the United States Chapter, International College of Surgeons, was called to order by the President, **Dr Custis Lee Hall**, at 2 p m on Oct 30, 1950, in the Cleveland Hotel, Cleveland, Ohio

Approximately two hundred attended this meeting, including many of the members of the United States Chapter whose privilege it is to attend the meetings of the House of Delegates

The Minutes of the House of Delegates' meeting held on Dec 18 1949 were approved, after which the usual reports were made

Report of the President (Dr Custis Lee Hall) Dr Hall welcomed the members of the House of Delegates and expressed his gratification at the fine attendance and his deep appreciation of the splendid cooperation given him during his tenure of office He referred to the Presidential Address, presented by **Dr Herbert Acuff** at the meeting of the House of Delegates held on Oct 13, 1945 in which Dr Acuff stressed the importance of maintaining high standards in requirements for membership in the International College of Surgeons Dr Hall continued "I am happy to state that, with the establishment of the International Board of Surgery in 1946, we have gone far Not only have we conducted examinations in most of the surgical specialties, but we have established a reputation for honesty, integrity and the highest standards of examination for certification We have also raised the standards not only by having Certified Fellows but by choosing men to become Associates who, in five years, will have the opportunity to qualify as Certified Fellows The examinations conducted in Chicago at the Home of the College and at the Cook County Hospital have brought together a group of examiners who are doing excellent work'

Dr Hall went on to stress the importance of the Conference Committee, functioning under the chairmanship of **Dr William Carpenter MacCarty** This Conference Committee investigates candidates of mature years whose surgical competence and ethical conduct have been established and who during this personal conference, offer evidence of unquestionable qualifications In these instances formal written examinations are waived Dr Hall then pointed out the fact that the creation of Junior Membership in the United States Chapter marked a step forward for the College and announced that at the Cleveland Convocation a class of fifty Junior Members consisting of young surgeons who have "started on their upward course in the development of their surgical ability and training" would be admitted He expressed his appreciation of the fine work which has been done by **Drs Arnold Jackson** and **William B Hobbins** of Chicago in organizing this group Dr Hall remarked that there are now one hundred and seventeen Regents and Vice Regents in the United States Chapter and that, through the cooperation of this group, outstanding sectional meetings have been held in Tuscaloosa by the Alabama Section, in Los Angeles by the Southern California Section and in Denver by the combined Colorado and Wyoming Sections He then spoke of the magnificent Home of the College and of the purchase of the mansion adjoining the original College property He stated that [illegible] now under way for the best possible utilization of this additional space. He mentioned the outstanding work done by Dr. Herbert Acuff in connection with the Home of the College. Dr. Hall commented on the splendid growth of the *Journal*, not only in circulation but in type, scope, contents and influence. He then expressed appreciation to all of the officers, regents, vice-regents and members, saying, "I thank you sincerely for your splendid cooperation in the past two years in the attainment of the present high standard of the United States Chapter. I am sure that, with your continued cooperation and determination to foster the ideals of the College, we will establish ourselves even more surely as one of the greatest surgical organizations in the free world of today."

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*The House of Delegates as defined in the Constitution and By laws is composed of the Executive Council the Board of Trustees and the Board of Regents

The President's message was accepted.

Report of the Secretary (Dr. Arnold S. Jackson): Dr. Jackson expressed his pleasure in the honor conferred upon him in his election as Secretary at the St. Louis meeting of the House of Delegates two years ago. He said that, although his predecessor had apprised him of the work entailed, he has found this office "a pleasant experience." "It has been an inspiring experience," he continued, "to work with so loyal, so friendly and so devoted a group of men—men who are always willing to make great personal sacrifices for the best interests of the College." He stressed the value of the friendship extended to him by the leaders of the College and stated that in his travels back and forth across the country he has been able to make many new friends. He pointed out that upon assuming his duties of office he had made several suggestions, which were readily approved by the Executive Council. He expressed his appreciation of the cooperation of the secretaries with whom the College had provided him.

Dr. Jackson remarked that his work as Chairman of the Program Committee was difficult during the first year because of the brevity of time before the Atlantic City Assembly but that, despite this handicap, a successful program was arranged. He expressed his appreciation to **Dr. Moses Behrend** for his cooperation and work in organizing the clinical day in Philadelphia during the Atlantic City Assembly, and to others for their wholehearted cooperation.

He spoke on the Cleveland Assembly and expressed great pleasure in having secured the cooperation of the Faculty of Medicine of Western Reserve University in supplying the lectures in Basic Sciences preceding the Thyroid Symposiums. He pointed out that the Assembly Program brought together a distinguished group of speakers in the field of goiter surgery and that three past presidents of the American Goiter Association participated in the Cleveland Program. Dr. Jackson pointed out the fact that he had assisted Dr. William B. Hobbins in organizing the Junior Membership group. In speaking of the growth of the United States Chapter, Dr. Jackson called attention to the fact that at the Atlantic City Assembly a urologic meeting was arranged and that out of that meeting a Section on Urology was formed. He expressed his hope that a Section on Obstetrics and Gynecology would be organized during the Cleveland Assembly.

In outlining the future activities of the College, Dr. Jackson stated: "From the experience I have so far acquired, it is my feeling that the College, in its tremendous growth of recent years, needs more than anything else to be welded more closely together. With this in mind, a Secretary's letter was recently sent to all Regents and Vice-Regents. In addition, space in the *Journal* has been devoted to news of various state and sectional meetings and to the membership."

In conclusion, Dr. Jackson expressed his appreciation "to the members of the Council for their cooperation and loyal support; to my assistants for their splendid help, and to the members for their enthusiasm and assistance." (Report approved.)

Report of Chairman of the Board of Regents **(Dr. Gilbert F. Douglas)**: Dr. Douglas expressed his appreciation to the Regents and Vice-Regents, as well as the Executive Council, for the wholehearted cooperation he has received during the past two years, and to the members for their interest and suggestions. He spoke briefly on the various sectional meetings and their value in respect to the growth and development of the Chapter, emphasizing the fact that the Regents and Vice-Regents of each state are exceedingly influential in bringing about an increase of membership within their respective states and stressing the importance of a well-knit organization within each state and the planning of sectional meetings throughout the country

The reports of the Board of Trustees and the International Board of Surgery, presented by **Dr. Karl Meyer**, Chairman, were approved

The following officers were elected for the period of 1950 1952·

President-Elect, Dr William Randolph Lovelace, Albuquerque, New Mexico

1st Vice-President, Dr William Wayne Babcock, Philadelphia, Pennsylvania

2nd Vice-President, Dr Oswald S Lowsley, New York

3rd Vice-President Dr Louis A Buie Rochester, Minnesota

4th Vice-President, Dr Moses Behrend Philadelphia

5th Vice President, Dr Claude J Hunt, Kansas City, Missouri

Secretary, Dr Arnold S Jackson, Madison Wisconsin

Treasurer, Dr Oscar B Nugent Chicago

Member of the Board of Trustees Dr Elmer Henderson Louisville, Kentucky

The meeting was then formally adjourned

Argentine Chapter

At a meeting of the Argentine Chapter of the International College of Surgeons, held in Buenos Aires on Dec 27, 1950, the following officers were elected· President, **Dr. Jorge A Taiana**; First Vice-President, **Dr. Augusto Wybert**; Second Vice-President, **Dr. Carlos Bergara**; Secretary, **Dr. Abel N. Canonico**; National Regents, **Dr. Alberto Baraldi, Dr. Delfor Del Valle, Dr. Carlos I. Rivas, Dr. Jorge A Taiana** and **Dr. José M Urrutia**; Corresponding Secretary, **Dr. Jose María Pelliza**, and Treasurer, **Dr. Roberto A Goyenechea.**

Regents for Surgical Specialties were elected as follows Gynecology, **Dr. Roberto Gandolfo Herrera**; Orthopedic Surgery, **Dr. Luis Weber**; Obstetrics, **Dr. Josue Beruti**; Traumatic Surgery, **Dr. August Wybert**; Thoracic Surgery, **Dr. Oscar Vaccarezza**, Neurosurgery, **Dr. Ramón Carrillo**; Plastic Surgery, **Dr. Hector Marino**; Surgery of the Abdominal Walls, **Dr. Ivan Goño Moreno**; Gastrointestinal Surgery, **Dr. Abel Canonico**; Proctology, **Dr. Manuel Casal**, Surgery of the Liver, Pancreas and Biliary Passages, **Dr. Delfor Del Valle**; Surgery of the Endocrine Glands, **Dr. José A. Caeiro**; Urology, **Dr. Alberto Garcia**; Ophthalmology, **Dr. Ernesto R Bernasconi Cramer**; Vascular Surgery, **Dr. Alfonso R Albanese**; Otorhinolaryngology, **Dr. Antonio E. Carrascosa**; Oral Surgery, **Dr. Carlos Bergara**; Surgery of the Head and Neck, **Dr. Carlos de Nicola**; Surgery of the Spleen and Hemopoietic Organs, **Dr. Miguel Angel Etcheverry**; Surgery of Equinococcosis, **Dr. José Manuel Jorge**; War Surgery, **Dr. Raul N. Velasco**; Pediatric Surgery, **Dr. José Maria Pelliza**; Anesthesiology, **Dr. Roberto A. Goyenechea**; Radiology and Physiotherapy in Surgery, **Dr. Manuel F. Terrizzano**; Antiobiotics in Surgery, **Dr. Enrique Savino**, and Experimental Surgery, **Dr. Arturo Martinez Borado.**

New Books

A History of Medicine. Vol. I: Primitive and Archaic Medicine. By Henry E. Sigerist. New York: Oxford University Press, 1951. Pp. 564, with 104 illustrations.

This is the first volume of a projected series of eight; a simple statement which becomes startling only after the reader realizes how much erudition and devoted study have gone into the first note of the octave. Dr. Sigerist, a research associate in medical history at Yale who in 1950 was awarded the coveted William H. Welch medal of the American Association of the History of Medicine, is a scholar indeed; yet he presents his great store of recondite knowledge in such a manner as to make it fascinting reading for professional men and laymen alike.

The volume covers primitive medicine and surgery in all its aspects, after which medical and surgical practice in ancient Egypt and Mesopotamia are thoroughly explored. The illustrations, most of which are grouped in a single section, are remarkable for their interest and variety. Mummies and skeletal parts with diseases still diagnosable are presented; a prehistoric apparatus for hydrotherapy is presented; there are charms, dolls and amulets for exorcising the spirit of disease, as well as effigies stuck full of nails and used in the infliction of disease or death upon enemies. A ceremony is pictured in which sickness was swept away with small brooms after ritual transference of the disease to fowls. A hideous statuette of the demon Pazuzu, purveyor of disease, is included, togethere with an elaborate diagram of the liver of a sheep as employed in prognostication.

If, as is to be expected, the remaining volumes of the series fulfil the promise of the first, Dr. Sigerist's work is destined to become a particular treasure in the libraries of those who value the human side of scientific development.

Sir Thomas Browne. By Jeremiah S. Finch. New York: Henry Schuman, Inc., 1950. Pp. 319. Illustrated.

Subtitled "A Doctor's Life of Science and Faith," this biography of the famous author of *Religio Medici* takes full account of the furore raised by this perennial classic among the ecclesiastics and laymen of its own time. It was an age in which theologians recognized no form of religion except the strictly orthodox, and Sir Thomas' liberal, if quaint, conceptions of the relation between man and his Maker were considered highly offensive if not actually heretical.

Liberal in the modern sense Sir Thomas was not, of course; he believed in witchcraft and subscribed to many misconceptions of nature and science current at the time. On the other hand, many other misconceptions universally accepted seemed to him absurd, and he did not hesitate to say so. The permanent value of his work lies ultimately in the fact that the seeds of liberal science were within him, and his limitations are ascribable to the genius of the age rather than to any deficiency of understanding in himself. In addition, he was master of a supremely engaging and memorable literary style, readable, reasonable and persuasive. Dozens of imitators emulated him, and there appeared books—most of them short-lived and now forgotten—dealing with the religion of every conceivable trade, profession and avocation. The present biography does full justice to his unforgettable personality.

Female Sex Endocrinology. By Charles H. Birnberg. Philadelphia: J. B. Lippincott Company, 1949. Pp. 134, with 30 illustrations.

Once again the human female is under observation, this time in the form of a restatement of a series of lectures given by Dr. Birnberg in a postgraduate course on sex endocrinology. The purpose, as quoted from the Foreword, was to manifest a "brief presentation of sex endocrinology" and to present "a discussion of the therapy most successfully used by the author in the treatment of sex endocrine disturbances." In fulfilling this purpose the author has been highly successful. The presentation includes a discussion of the hormones of the anterior pituitary gland and the hormones of the ovary; puberty and adolescence; diseases of the anterior pituitary gland; menstruation and disturbances of menstruation, ovulation; the climacteric; sterility; hirsutism; habitual miscarriage, and threatened abortion. In the form of a conclusion the author discusses laboratory procedures in endocrinology. Without claiming that his work is in any way definitive, Dr. Birnberg has submitted what he believes to be sound conclusions about every condition and anomaly peculiar to women, enhancing these conclusions by actual case histories and profitable illustrations. It is an invitation to increase one's own knowledge by sharing with the author his valuable experience in discovering and determining genuinely significant symptoms.

Anatomie Clinique et Operatoire. By J. Maisonnet and R. Coudane. Paris: G. Doin et Cie, 1950. 3 vol.; 2657 illustrations.

These three volumes on clinical and operative anatomy are an excellent contribution to contemporary surgical literature Anatomy being one of the foundations of proper surgical procedure it is evaluated thoroughly in this work as are modern operative technics Descriptive as well as the topographic anatomy physiology and surgical technic are amply discussed to give the reader a good comprehensive perspective of these particular phases of surgical endeavor as related to every region of the human body This is augmented by succinct pointed paragraphs on morphologic pathologic and roentgenologic interpretation of the questions at issue and is completed by modes of surgical approach and technical details of the particular operative procedures The authors have omitted bibliographic references other matters that have no practical interest and questions still under discussion and not definitely established

The work is illustrated with pen and ink drawings in the text and although most of these are diagrammatic they illustrate the points well A thorough knowledge of surgical anatomy is stressed by the authors All in all those who read French will find in this work a great deal of worthwhile material which can be well recommended to the general surgeon, the specialist and even the general practitioner who is desirous of marching along with the progress of modern medicine

An Atlas of the Blood and Bone Marrow By R Philip Custer Philadelphia W B Saunders Company, 1949 Pp 321, with 285 illustrations, 42 in color

The important publication, a permanent contribution to the scientific library, is lavishly illustrated throughout with magnificent histologic photomicrographs, the magnification being as high in some instances as 2280 Many of these are in full color The effect is striking indeed, and the accompanying text bears out the reader's expectations

The book opens with a discussion of the hematopoietic system in general, proceeding therefrom to a study of disorders of the blood and bone marrow and their histopathologic manifestations There is a highly interesting section on ill defined types of anemia Emphasis throughout the book is placed upon examination of sections as well as smears, since Dr Custer ascribes an equal diagnostic importance to the two and is of the opinion that this fact has been somewhat neglected His own contribution will inspire both interest and admiration

Color Atlas of Pathology Prepared under the auspices of the United States Naval Medical School of the National Naval Medical Center at Bethesda, Maryland Philadelphia J B Lippincott Company 1950 Pp 546 with 1,053 illustrations on 365 color plates

As distinct from Dr R Philip Custer's *Atlas* (reviewed in this issue) the pathologic color atlas prepared by the Naval Medical School covers diseases of all the various body systems and not all of the illustrations are photomicrographs though all are in color An equal interest is commanded and an equal importance observable in the photographs of patients with various diseases though these are naturally fewer in a work on pathologic study Clinical manifestations have great diagnostic importance to a trained eye and color presentation as has been mentioned formerly in connection with the fine work of Mr Hamilton Bailey and others is invaluable in showing the abnormal physical appearance in full detail

According to a foreword by Rear Admiral Lamont Pugh Deputy Surgeon General of the Navy the principal object of this work is to supply the practitioner with "a comprehensive concise and realistic source of reference in the study and interpretation of both gross and microscopic pathologic change The objective has been more than satisfactorily achieved

Skull Fractures and Brain Injuries By Harry E Mock Baltimore The Williams and Wilkins Company 1950 Pp 806, with 116 illustrations

The book, written by a consulting surgeon who lays no claim to being a brain surgeon but has had for more than forty years a consuming interest in injuries to the head, is an earnest study of such injuries from the point of view of incidence prevention and proper treatment In justification of the project, Dr Mock quotes Nicholas Senn "There is perhaps no department in surgery in which the general practitioner should be more interested than in fractures of the skull

Dr Mock gives all due emphasis to statistics and their bearing on the future handling of head injuries He discusses both clinical and physiopathologic manifestations, diagnosis and prognosis, treatment, both medical and surgical, the special requirements in treatment of children, and associated injuries and complications His work is above all practical down to earth and based as much upon common sense as upon an excellent foundation of technical knowledge It should be warmly welcomed by those who, like himself, are called upon repeatedly to diagnose and treat conditions sometimes mistakenly supposed to be exclusively the work of one specialist or another, for they will find herein experiences and problems with which they have no small acquaintance, together with some admirable suggestions

Abstracts from Current Literature

Rupture of the Pregnant Uterus by External Violence. Elias, M., M.R.C.S., Lancet 2:253, 1950.

Rupture of the pregnant uterus by external violence is rare; only 3 cases were found in the English literature.

The author's case, a primigravida, aged 23 and thirty-four weeks pregnant, was admitted to the hospital half an hour after being involved in an accident on the river. She had been standing on the deck of a motor launch approaching a closed lock gate. She had been crushed between the bridge of the lock gate and the roof of the cabin of the boat.

Examination disclosed a laceration of the abdominal wall. At operation the fetus and the placenta were found lying free in the peritoneal cavity on the left side. The uterus was completely torn across at the junction of the upper and lower segments. The broad ligaments on each side were torn into. After ligation of the uterine arteries, the lower segment of the uterus was repaired with catgut in three layers and the stump of the uterus covered with peritoneum. Bleeding from the lower segment was arrested by suturing. The transverse laceration was next dealt with, the edges and lacerated fat being excised. The postoperative course was uneventful.

The fetus showed a fracture-dislocation of the cervical part of the spine. The lower segment of the uterus and the neck of the fetus were crushed between the lock gate and the promontory of the patient's sacrum, which was held against the cabin roof.

At the operation the fetus and the placenta were removed and the peritoneal cavity was emptied as far as possible of blood and clot with a suction apparatus. The fundus of the uterus was excised with the fallopian tubes, both ovaries being preserved by division of the ovarian ligament on each side.

The patient was discharged from the hospital in good condition three weeks after the operation.

GILBERT F. DOUGLAS

Blood Volume Determinations in Surgery: An Analysis of 100 Cases. Beling, C. A.; Bosch, D. T., and Morton, T. U., Surg., Gynec. and Obst. 90:686, 1950.

Ordinary blood counts and hemoglobin and serum protein determinations usually do not reflect accurately the circulating hemoglobin and erythrocyte masses, the circulating plasma volume and the circulating proteins. Reduction of these circulating masses and volumes predisposes to operative and postoperative shock and influences convalescence.

One hundred consecutive major surgical cases are analyzed. In these a preoperative determination of the total blood, plasma, cell volume, circulating hemoglobin and proteins and total body proteins was made. Restoration of the deficient elements before operation and replacement of blood loss at operation was accomplished. It is believed that the volume tests are reasonably accurate clinically. A deficit of 500 milliliters of plasma volume in an adult is significant.

In patients with a total blood volume of 76.5 milliliters, a plasma volume of 40.5 milliliters, and a cell volume of 36 milliliters or less per kilogram of body weight, replacement of the deficit is mandatory. There was a significant deficit of blood volume in 75 per cent of the patients studied. Deficits ranged from 4,000 milliliters to zero in the 100 cases in this series. There was no trouble due to overloading the vascular system even though slightly more than the deficient elements often were replaced.

Replacement of blood volume deficits preoperatively and blood loss during operation have almost eliminated postoperative shock and has widened the scope of surgery. Postoperative convalescence has been rapid in patients thus treated as compared with the slow recovery of many not receiving the benefit of replacement.

J. O. MORGAN

Anlage Tumors of the Salivary Gland Type in Unusual Sites. Bella Halpert, Victor C. Hackney, Surgery 27:609, 1950.

Anlage tumors of the salivary gland type are usually in or near the parotid or submandibular glands and occasionally in the sublingual glands, but may occur anywhere along the line of fusion of embryonal facial fissures. About twenty of these neoplasms have, however, been reported as occurring in sites distant from the head. Ten of these were on the fingers and hands, two on the forearm, three on the lower extremities and one each in the inguinal region, the vulva, over the sternum and in the mammary gland.

The authors suggest that since these neoplasms are found in distal locations their development is probably not dependent on proximity, to salivary glands. They report 3 cases in which the tumors were near the eyes and 3 in which they occurred on the trunk, 1 being over the sternum, 1 in the breast and 1 on the back.

ggested that the derivation of these umors is from embryonal rests of the ectoderm, the anlage separating before the cells have acquired their dominant characteristics as ectodermal or mesodermal cells All of these tumors are benign, though at times they may become locally invasive

VICTOR T HUDSON

Headaches and Head Pain of Ocular Origin. Ruedemann, A D, J A M A 144 517, 1950.

Ocular headache makes itself evident in the evening after a day's work and tends to pass off when the patient rests his eyes The headaches occur most frequently in "run down" persons, in women during late pregnancy in adolescents and in young persons whose work requires constant use of their eyes It is important that these patients be given muscle balance tests along with the careful eye examination Every child must be checked before entering school

Types of ocular abnormalities causing unilateral head pain are (*a*) ciliary spasm, (*b*) spasm of a single ocular muscle, (*c*) localized neuralgia, (*d*) inflammation of the gasserian ganglion, (*e*) irritation of an internal carotid artery by an aneurysm and (*f*) malocclusion of the temporomandibular joint. Glaucoma of any type may produce severe pain. It is wise in certain instances to advise the removal of blind and useless eyes Bilateral head pain may be ocular in origin, but glasses are not always indicated

Frontal headache may be due to (*a*) esophoria, (*b*) hypermetropia, (*c*) anisometropia or (*d*) hyperphoria Occipital and suboccipital headache is due to convergence insufficiency. Radiating pain to the shoulders and arms may be due to convergence insufficiency or hyperphoria Cervical pain may be present because of ocular muscle imbalance

CLAUDE M. WARREN

Excretion of Potassium after Partial Gastrectomy. Wilkinson, A W, Nagy, G., Billing, B H., and Stewart, C. P, Lancet 2·135, 1950

The authors made a study of potassium excretion with 5 patients who underwent partial gastrectomy for duodenal ulcers Before and after operation the nitrogen balance was studied, the intake of sodium and chloride controlled and the potassium measured

Before operation, on an intake of about 3 gr of potassium daily, there was a small positive balance After operation the potassium intake was nil for one to four days and then gradually restored to the postoperative level, which was regained in four to seven days postoperatively. For one to three days after operation the daily total quantity of potassium rose above the preoperative level in spite of the absence of any intake During the succeeding five or six days the daily urinary excretion of potassium was reduced even though its intake had been resumed On about the seventh or eighth day after operation both the intake and the excretion of potassium had returned to the preoperative level The immediate postoperative increase in potassium excretion is in sharp contrast to the coincident decrease in excretion of sodium and chloride which occurs in spite of an increase in the intake of these ions

The widespread nature of the electrolytic changes in the immediate postoperative period is evidence against the view that there is a destruction of tissue with liberation of potassium from the destroyed cells and consequent excessive excretion of potassium The most likely source of this temporary excess of potassium is the intracellular fluid In the early hours after injury an inflammatory exudate forms in the damaged tissues This results in an acute demand for fluid containing protein and electrolytes The demand is satisfied primarily from the plasma, which in turn leads to the withdrawal of extracellular fluid from uninjured areas The withdrawal of extracellular fluids causes a widespread disturbance in the extracellular-intracellular fluid balance Consequently water and electrolytes pass into the extracellular spaces from the cells The chief intracellular cation is potassium The excessive potassium concentration of the extracellular fluid is passed on to the plasma resulting in an increased excretion of potassium in the urine

In the author's opinion further precise measurements are needed to establish the hypothesis, but it is worth pointing out that it is consistent with various clinical observations

J O. MORGAN

Meigs's Syndrome Beresford, O D, and Aidin, R, Lancet 2 211, 1950.

A definite clinical syndrome was not established until 1937, when Meigs and Cass reported 7 cases (4 of their own and 3 others)

Ascites and hydrothrax have also been observed with tumors other than fibroma of the ovary.

The authors report the case of a 77-year old married woman on whom a paracentesis abdominis was done Five litres of yellowish fluid removed prior to laboratory, at which a malignant neoplasm of the ovary was discovered.

The cause of the effusions is not known, and various theories have been brought forward to explain them Selye's alarm reaction (1936) has been suggested as the mechanism responsible. This hypothesis suggests that the effusions are the result of an irritant which produces a hypersensitive state (in the present a pelvic tumor), but it does not explain why only some pelvic tumors produce the syndrome. Dockerty and Masson (1944) observed that edema of the tumor and/or the pedicle appeared to be related to the ascites, which was absent when there was no edema.

GILBERT F. DOUGLAS

Blood Test for Cancer. Black, M. M., Rev. Gastroenterol. 17:481, 1950.

Black reports a specific serologic test for cancer. This is based on a decreased ability of the serum of cancer patients to reduce methylene blue. He reports on a series of cases in which the test was evaluated.

There was an overall identification accuracy of 89 per cent. Complete extirpation of the carcinoma will be followed by alteration of the test to normal within seven to ten days.

However, the reactions are not entirely specific. Cirrhosis, pregnancy and other conditions produce similar changes. Further statistical evaluation will be necessary to assess the value of this test.

M. T. FRIEDELL

Evaluation of the Black Test as a Screen Test for Malignancy. Nadler, S. B., and Gordon, S., South. M. J. 43:204, 1950.

Nadler and Gordon present an analysis of data obtained from the Black test on 1,760 patients, 247 of whom had proved malignant disease. Approximately 75 per cent of these had correct positive Black reactions, but in 60 patients there were false negative reactions.

Of patients without known malignant disease, approximately 78 per cent had a correct negative black reaction, and the remainder apparently had "false positives." Of course, it cannot be proved that some of these patients did not have malignant disease.

M. T. FRIEDELL

Diagnosis of Multiple Ocular Muscle Paralyses. Knewson, W. E., J.A.M.A. 144:534, 1950.

The author presents an excellent discussion of the diagnostic procedures needed to determine which ocular muscles are paralyzed. These procedures include the Maddox rod and screen tests, duction and version tests, the study of diplopia fields, pass pointing and head tilting.

Confusing factors leading to uncertainty in diagnosis are discussed. The most commonly encountered types of multiple paralysi are also discussed and are well worth studying in detail.

CLAUDE M. WARREN

Cyst of Patent Urachus. Getz, R. J., and Thomas, D. E., U. S. Armed Forces M. J. 1:436, 1950.

Getz and Thomas present a case of a patent urachus in a 30-year-old man. This is a relatively rare condition. The urachus is situated between the transversalis fascia and the peritoneum and is lined with stratified squamous epithelium. It is rarely more than 5 cm. in length and approaches the umbilicus only under abnormal conditions. The distal termination of the urachus at the bladder is covered by a transverse fold which prevents the entrance of urine. The majority of instances of urinary drainage from the umbilicus are not due to urachal anomalies but to failure of closure of the upper end of the bladder. It is suggested that a more specific term, vesicoumbilical fistula, be applied. The incidence is subject to question because of improper diagnosis. Four main pathologic types are noted: 1. Complete—patent throughout from bladder to umbilicus. 2. Blind external end—patent at the umbilical end only. 3. Blind internal end—patent at the vesical end only. 4. Blind end—cyst the most common type. The diagnosis is usually not made unless infection occurs. Low abdominal pain and tenderness are the most common complaints. Frequently a suprapubic mass is palpable. The diagnosis is not easy but is facilitated by cystoscopic, cystographic and roentgenographic study. The treatment is always surgical and consists of incision, drainage and excision.

WALTER M. KEARNS

Reconstruction of Index Finger with Nail Transplantation. Berson, M. I., Surgery 27:594, 1950.

Anyone who has suffered the loss of a thumb or an index finger can testify that restoration would be of prime importance. This article summarizes the principles involved in restoring a forefinger, transplanted toenail and pedicle graft in which was placed a cartilage implant.

The flexor and extensor tendons were attached to the pedicle graft. This permitted flexion of a 90-degree angle and complete extension.

There was no loss of sensation in the skin of the finger stump. The V incisions used in fashioning the finger pedicle junction provided good surface attachment, good blood supply and elasticity of the skin.

The cosmetic results were extremely gratifying, because the transplanted fingernail remained viable. Langer's lines on the pedicle closely paralleled those of the finger stump. There was consequently inappreciable cosmetic textural change.

HARVEY E. BILLIG

Information on Electron Microscope A brochure describing and explaining the new RCA electron Microscope type EMT, has been released by the Scientific Instrument Section of the RCA Engineering Products Department. Twelve pages in length and profusely illustrated, the booklet demonstrates the utility of this table model electron microscope in hospital laboratories, schools and various industrial fields. It contains full particulars as to operation and performance. Diagrams and photographs explain the principles of electron optics and electron microscopy. Requests for this brochure should be addressed to Department 521, Engineering Products Department, Radio Corporation of America, Camden 2, New Jersey.

New Phosphatase Substrate The Sigma Chemical Company of St. Louis is preparing p nitrophenyl phosphate SIGMA, a phosphatase substrate recommended in the diagnosis of rickets, hyperparathyroidism and disease of the liver. In the presence of these conditions the phosphatase content of the serum is extremely important and may be the most satisfactory index for detecting the deficiency. Studies of these diseases require a rapid method of determination of the phosphatase content of small amounts of serum. It is claimed that with this new preparation fifty to one hundred analyses may be accomplished in two hours, only 0.005 ml. of serum being required for each. The method is recommended for both macrodeterminations and microdeterminations and for either acid or alkaline phosphatase and is said to offer a considerable saving of time as compared with methods using glycerol phosphate and phenyl phosphate as substrates. The compound is colorless, but when the phosphate group is split off the yellow salt of p nitrophenol is liberated. This salt has an absorption maximum of 400 mμ so that the substrate acts as its own indicator of phosphatase activity. Even the blank correction can be read from the same sample.

New Monochromator The Cambridge Thermionic Corporation of Cambridge, Massachusetts offers a new monochromator as a simple source of monochromatic light. The device utilizes the rotary power of quartz. According to the distributors, it eliminates the cumbersome arc light and prism arrangement, yet gives a beam of higher intensity. Collimated light from a tungsten filament lamp will yield adequate illumination at all wavelengths in the new monochromator because of the large light aperture available—a full inch.

In the quartz monochromator, white light from a tungsten source is passed through basal sections of optical quartz laminated to polaroid sheets. By a synchronous rotation of the quartz section the wave length of transmitted light can be varied continuously through the visible spectrum. The instrument produces an average band width of 150 Angstrom units. An adjustable support is provided for tilting the monochromator in line with light source and the microscope or other apparatus to be used.

Inquiries should be addressed to Cambridge Thermionic Corporation, 517 Concord Avenue, Cambridge 38, Massachusetts.

Outline of Chemical History An outline of the history of chemistry, which is expected to have permanent value for practicing chemists, students and teachers, will be made available within a few days by the Mallinckrodt Chemical Works of St. Louis. The detailed and comprehensive outline starts with the pre Christian origins of chemistry in India, China and Egypt and traces the evolution of the science up to the present time.

The outline, which is in the form of a flow sheet, consists of two charts printed side by side on a sheet of paper measuring 35 by 35½ inches. The first chart opens with the remote beginnings of the chemical science, moves into medieval alchemy, the chemistry of combustion, pneumatic chemistry, the beginnings of organic and biologic chemistry, etc. and ends with the work of Lavoisier. The second chart continues the story through the beginning of the era of synthetic organic chemistry, the discovery of the elements, the modern concept of valence and molecular structure, etc., ending in 1950 with the elements Berkelium (97) and Californium (98).

The hundreds of entries on the two charts are arranged chronologically, with interconnecting lines to indicate relationships between men, theories, laws and discoveries. The outline is printed in four colors, which are used to identify the main streams of chemical history. An index of names, with birth and death dates, increases the usefulness of the charts.

Bordering the outline itself are illustrations of early equipment and laboratories (Agricola's, Glauber's, Becher's, etc.,) On the back of the outline are portraits of early chemists prominent in the development of analytical chemistry (Paracelsus, Hoffman, Lavoisier, etc.), five examples of the accomplishments of modern analytical chemistry (in the manufacture of synthetic rubber, in the development of the atomic bomb, alloying metals in steel, etc.), and milestones in the development of many laboratory chemicals, invention and use of Bell Closure bottles, steady expansion of its system of distributors, etc.)

In Memoriam

HAROLD D. CORBUSIER

M.D., F.I.C.S.

The recent passing of Colonel Harold D. Corbusier at his home in Santa Fe, New Mexico, not only deprived the International College of Surgeons of a valuable member but wrote "finis" to a highly distinguished career. A veteran officer of four campaigns—the China Relief Expedition in 1900, the Philippine campaign in 1901-1902, the Mexican Border campaign in 1916 and World War I in 1916-1919, Dr. Corbusier made memorable contributions to the achievements of the Army Medical Department. During World War I he organized the Section on Orthopedic Surgery of the Surgeon General's Office under General Gorgas and formulated the first special order for the establishment and conduct of courses of instruction for newly appointed orthopedic surgeons. Some of his most important work was done in connection with "manpower salvage" and was based upon his firm conviction that men with moderate physical defects were or could be made fit for military service. His success in this connection led to the further development of the work at Camp Meade, where his rehabilitative procedures became famous under the general name "The Camp Meade Method." At the same station Dr. Corbusier organized and commanded a 2,000-bed emergency influenza hospital; manded a 2,000-bed emergency influenza hospital.

Dr. Corbusier's entire professional life, indeed, was marked by steadily successive achievements of note and the honors they so well deserved. He was well known as president or past president of many professional groups, as an author on subjects in his field, and as the inventor of several Army devices that proved greatly advantageous to the service. He was a member of the Association of Military Surgeons, the Academy of Physical Medicine of the United States, the American Medical Association, the Military Order of the World Wars, the Board of Trustees of the National Society for Crippled Children, the International College of Surgeons, and many other organizations both professional and social. A man of geniality and widely diversified human interests, Dr. Corbusier leaves many sorrowing friends behind him, both within the College and without it, to say nothing of the grievous loss to surgical science represented by his death. The warmest sympathies of the International College of Surgeons are tendered to his bereaved family.

EDUARDO BORGES DA COSTA

M.D., F.I.C.S. (HON.)

Prof. Dr. Eduardo Borges da Costa was born in Rio de Janeiro on February 5, 1880 and died on September 6, 1950. Dr. Borges da Costa was Professor of Surgical Clinics in the Faculty of Medicine of the University of Belo Horizonte, and Dean of the Surgeons of Minas Gerais.

On August 1, 1950, Dr. Borges da Costa was made an Honorary Fellow of the Brazilian Chapter and, during the Seventh International Assembly at Buenos Aires, he was awarded an Honorary Fellowship in the International College of Surgeons.

During the First World War, in recognition of services rendered as surgeon in the Hospital "Val de Grace" in Paris, Dr. Borges da Costa was made a Knight of the Legion of Honor of France. Other honors received in recognition of his work during the First World War include: Medal of Officer of the Academy of Paris; Officer of the Order of Leopold I of Belgium; Victory Cross and War Cross received from the Brazilian Government. Dr. Borges da Costa was a Colonel Doctor of the Reserve of the Second Line of the Brazilian Army.

STEPHEN SANTANGELO

M.D., A.I.C.S.

On June 7, 1950, Dr. Stephen Santangelo, 51, of Jersey City, New Jersey, died of a heart attack after a short illness. Dr. Santangelo received his medical degree from Temple University School of Medicine. He did postgraduate work at the New York Postgraduate Medical School and Hospital, the New York Polyclinic Hospital and Medical School and the Cook County Graduate School of Medicine, serving his internship at the Jersey City Hospital. In the capacity of attending surgeon, Dr. Santangelo was affiliated with the following hospitals: the Jersey City Medical Center; the Hudson County General Hospital; the New York Postgraduate Medical School and Hospital, Columbia University; the Private Service Jersey City Medical Center, and the Jersey City Medical Center. From 1934 to 1942 he taught Operative Surgery and Colon and Rectal Surgery at the New York Postgraduate Medical School and Hospital. His practice was devoted to general surgery.

HOME OF THE
INTERNATIONAL COLLEGE OF SURGEONS
and the
UNITED STATES CHAPTER
1516 1526 Lake Shore Drive
Chicago 10 Illinois

CALENDAR OF MEETINGS

May, 1951

21-25.............Société Internationale de chirurgie orthopédique
et de traumatologie
Stockholm
Dr. J. Delchef
34, rue Montoyer, Brussels

July, 1951

International Society of Blood Transfusion
London
Centre national de Transfusion sanguine
6, rue Alexandre Cabanel, Paris
M. Bernard Rouzet

September, 1951

3-7...............International Anesthesia Research Society
London
Mr. R. W. Cope
University College Hospital, W C 1
London, England

11-14.............United States Chapter, International College of Surgeons
Palmer House, Chicago
Dr. Arnold S. Jackson
1516 Lake Shore Drive
Chicago 10, Illinois

October, 1951

1-6...............Congrès de l'Association française de Chirurgie
Paris
12, rue de Seine, Paris 6ème
Prof. Brocque

Congrès francais d'Oto-Rhino-Laryngologie
Paris
Dr. H. Guillon
6, avenue MacMahon, Paris

December, 1951

American Medical Association Clinical Session
Dr. George F. Lull
535 North Dearborn St.
Chicago 10, Illinois

COLLEGE INTERNATIONAL des CHIRURGIENS

FOUNDED BY DR MAX THOREK

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International College of Surgeons

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Original Articles

Gravitational Leg Ulcers and Allied States

H KELIKIAN, M D, F A C S, F I C S
CHICAGO

THE number of men and women who seek advice for recurrent leg ulcers attests to our failure to lend anything more than temporary aid to these patients A state of wishful dependence on injections salves stockings boots and inadequate surgical procedures warps present day management of leg ulcers and related conditions Stagnation may be due to multiple scars insulating the ulcer bearing area after repeated operations on the tibia or it may occur from lack of muscular activity and movement as in cases of arthritis with two or three stiff joints More commonly it is caused by reverse flow of venous blood and is associated with varicosities of the veins of the leg

Surgical Pathologic Picture —The *deep veins* of the leg are only rarely the seat of stagnation, they are located within the confines of the crural fascia and benefit from the squeezing action of muscular contraction The deep veins exist as numerous anastomotic channels which are equipped with valves, they intercommunicate through and around muscles and accommodate the blood during muscular contractions As these plexiform vessels approach the joint (the knee, for instance) they thread out into paired or single pathways and from these emerge annectant veins

Annectant veins connect the deep channels within the crural fascia with the superficial system They penetrate the deep fascia and must be distinguished from the communicating vessels, which connect the superficial veins outside it Perforating annectants are at some distance from the joints and escape being stretched or kinked during movements of the segments of the limb The normal direction of blood flow through perforating annectants is from the deep compartments to the superficial in the foot and in the leg from the superficial to the deep set of veins However, venous flow in reverse direction is not necessarily pathologic and does not denote valvular incompetence in the annectants, as is generally assumed In the leg, for example, during heavy muscular activity, excess blood may pass out of the deep channels into the superficial veins by way of the annectants Perforating annectants are additional safety outlets during muscular contraction they help to relieve the congestion in the deep veins by permitting the excess blood to pass into the superficial channels T[illegible] disposition of annec

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From the Department of Bone and Joint Surgery Northwestern University Medical School Wesley Memorial and Cook County Hospitals Chicago

Submitted for publication Dec 15 1950

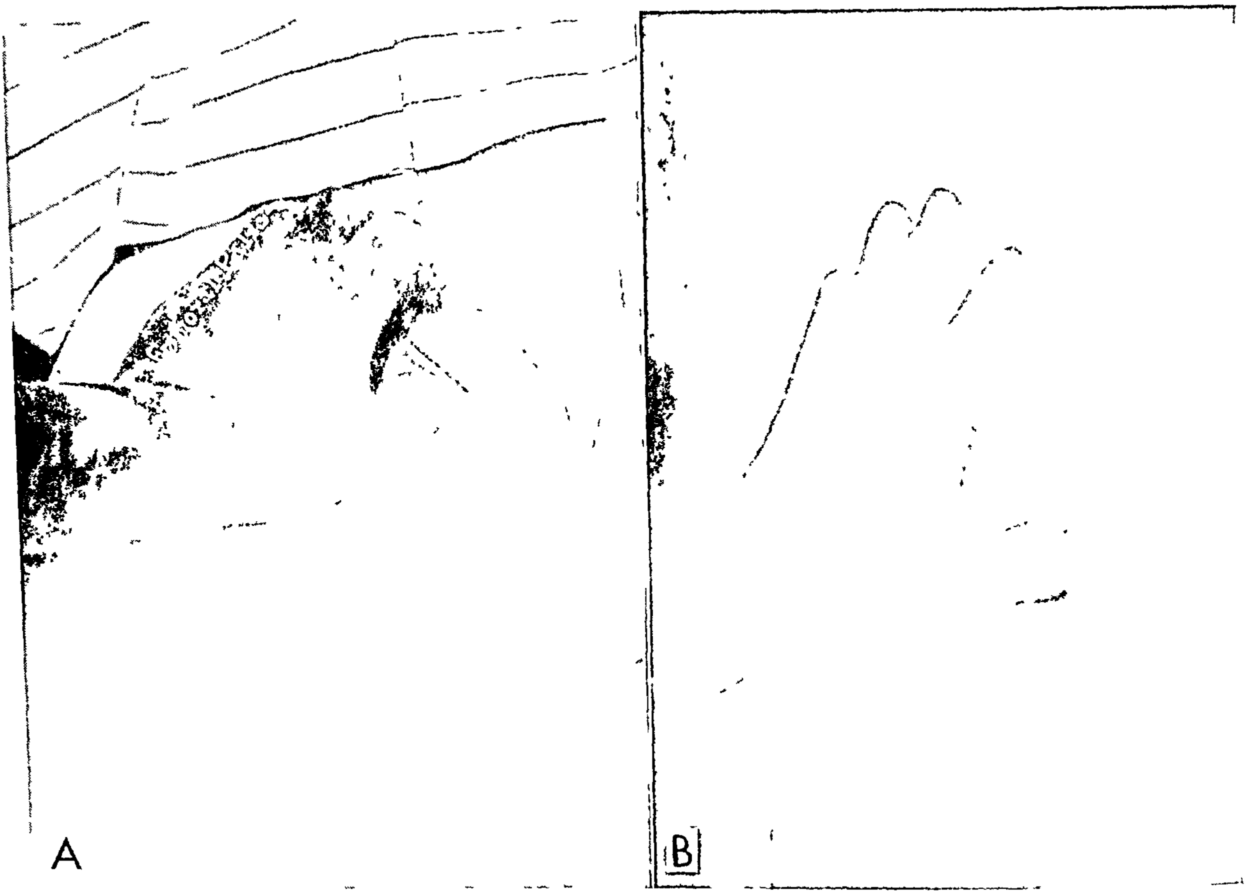

Fig. 1.—Segmental vein ligation. *A*, localizing the saphenous vein in the groin (after W. R. McNealy). The incision here parallels the dorsum of the distal phalanx of the flexed thumb. *B*, localizing the saphenous vein below the bend of the knee. Here the skin cut runs parallel to the volar surface of the abducted and extended thumb.

tants is more or less transverse or at an angle to the longitudinal axis of the limb. They become dilated up to their point of entrance into the deep fascia. Varices do not extend into the portion of the annectant inside the deep fascia; nor does inflammation, except on rare occasions. With the enlargement of their caliber, the valves of the segment of the annectants outside the deep fascia separate. The resulting incompetence extends to the deep fascia, not inside it: varices within and around muscles are rare. Extrafascial varicosities of annectant veins and incompetence of their valves is secondary to stasis within the superficial set of veins, or the saphenae.

The short saphenous vein, which is the remnant of the postaxial, or sciatic vessel, loses its longer femoral stem and empties into the popliteal trunk. Occasionally it opens instead into the greater saphenous vein; more often the two are linked by several communicating branches. When the short saphenous vein connects with the popliteal vein, as it usually does, it pierces the deep fascia 2 to 4 inches (5 to 10 cm.) below the bend of the knee and passes upward between the fleshy bellies of the gastrocnemius. It is thus partly overtaken by the deep fascia and benefits from the contraction of the muscles of the calf. The unsupported portion occasionally becomes overfilled by the backflow from the greater saphenous vein through superficial communicating branches. Less commonly, reflux flow from the popliteal vein causes stagnation within the short saphenous trunk. Stasis in the short saphenous is occasionally the cause of an ulcer which overlies the distal part of the fibula or the outer malleolus of the ankle. The terminal sensory branch of the musculocutaneous nerve crosses this area, and ulcers along the lower lateral aspect of the leg are inordinately painful.

The long saphenous vein is the main channel of gravitational stasis. It is the longest vein of the body, and throughout its entire course it travels within the subcutaneous fascia; it receives no muscular support. Developmentally it constitutes the unaltered remnant of the primitive preaxial vein. It loses no segments as does the short saphenous, and enters into the deep fascia to connect with the femoral vein in the groin. In the fetus, about the fifth month, the long saphenous receives its full quota of valves, which vary from eight to twenty pairs per vein. Thereafter, if anything, the valves diminish in number; they do not increase. With the growth of the limb before and after birth, the vein stretches to an inordinate length. The segment between alternate sets of valves becomes elongated. In adults the column of blood sustained by a pair of valves of the vena saphena magna is longer than that of any other vein in the body.

Apart from its length and lack of muscular support, the long saphenous vein suffers most from the effects of gravity, as the direction of blood flow within it, in standing and walking, is antigravitational. Gravity dams the blood back into the lower reaches of the vein. Excess blood causes loops of the vein to dilate and become tortuous; more blood stagnates, and the heavy load hastens the final breakdown of the already weakened, inadequate valvular support. Venous flow often assumes a reverse course downward toward the leg. Pooled blood is poor in oxygen content, poorer than ordinary venous blood; its cells age and disintegrate without entering into the general circulation. Broken down blood elements seep through the weakened venous walls into the subcutaneous tissue, pigmenting and discoloring the skin.

The distal portion of the long saphenous vein runs across the medial surface of the tibia just above the ankle joint, where the skin forms a snug sleeve. This segment of the vein does not benefit from the transmitted impulse of muscular contraction. It can only empty itself with the movements of the ankle; when the ankle is plantar flexed the vein is flattened out against bone by taut skin. Stagnation here is common, especially in persons with stiff ankle joints. The overlying skin is comparatively immobile, poorly nourished and extremely vulnerable. Trauma, passive congestion and tissue anoxia perhaps all contribute to its final breakdown. Ulceration invites infections of varying intensity; the subcutaneous tissue under and around the ulcer becomes infiltrated, thickens and undergoes extensive fibrosis. Within this matted scar lie pipelike sclerotic veins which fail to collapse even with carefully applied pressure bandages. Blood trickles through them in reverse direction into the ulcer, and infection invades

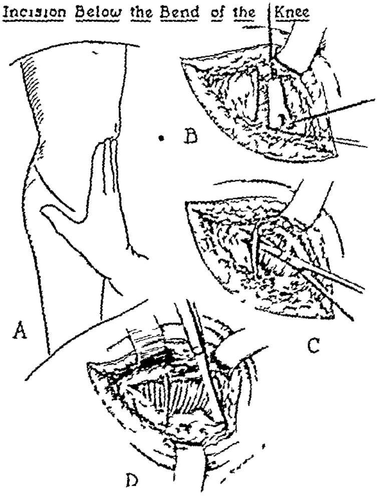

Fig. 2.—Crural fasciotomy. The incision below the bend of the knee, like the others in the lower part of the leg, serves the dual purpose of vein ligation and fasciotomy. *A*, the incision to locate this portion of the saphenous vein and at the same time to slit the deep fascia underneath it parallels the volar surface of the surgeon's abducted thumb. *B*, the saphenous vein and its smaller tributaries are ligated. The saphenous nerve, which comes down from Hunter's canal, lies on a deeper plane and somewhat posterior to the vein. It is isolated and left intact when the ulcer is painless; it is severed in extremely painful ulcers. *C*, the crural fascia overlying the origin of the flexor group of muscles and the medial belly of the gastrocnemius is widely slit. *D*, the fascia is stripped [illegible] the medial border of the tibia.

their interior; the lumens of the veins become partially or completely plugged with thrombi. Phlebothrombosis, thrombophlebitis, periphlebitis, cellulitis and fibrosis of the subcutaneous tissue coexist and contribute to one another. There is a variable degree of anoxic thickening of both skin and skeletal elements. However, inflammation seldom extends beyond the inner surface of the deep fascia into the muscular compartment, though its outer aspect becomes thick, scarred and matted with the superficial fascia and the skin.

The deep or crural fascia envelops and anchors the muscles of the leg. It encloses the main arterial trunks. Within its confines the deep lymphatics run along the arteries and afferent flow of lymph is greatly added, whipped, by arterial pulsation as well as by muscular contractions. Superficial lymphatics of the leg accompany the veins, through the unsupported subcutaneous fascia. There exists no communication between the deep and superficial lymphatic systems of the leg except near the joints through lymph nodes. The

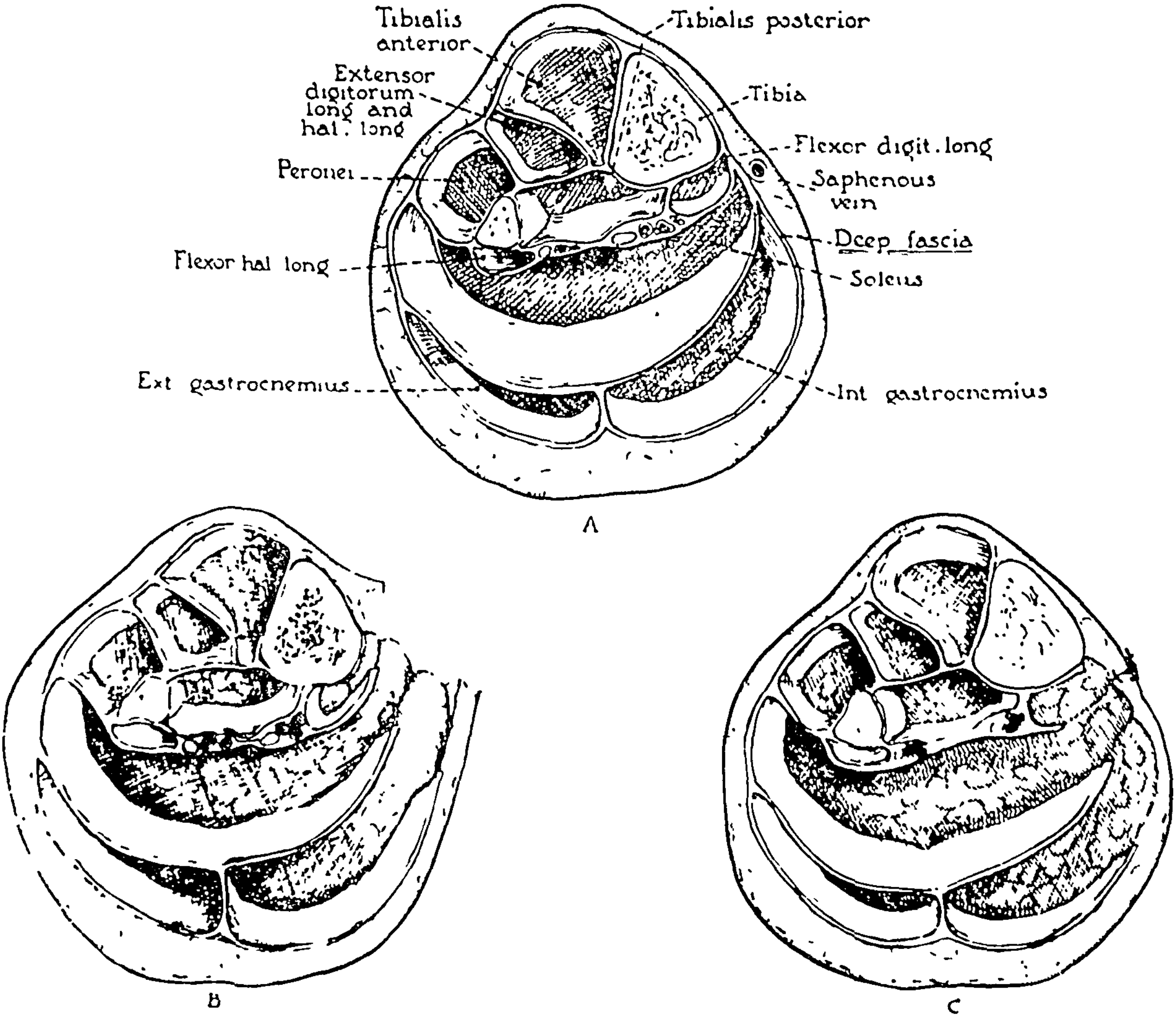

Fig. 3.—Crural fasciotomy as depicted by drawings of a cross section of the leg. *A*, section through the leg slightly below the level of the preceding incision, showing various fascial compartments. (Redrawn from J. M. Bourgery's *Inconographia D'anatomia Chirurgia E di Medicina Operatoria*, Florence, 1841.) *B*, sketch indicates removal of the fascia over the medial belly of the gastrocnemius and the flexor muscles and extirpation of the septum between these two compartments. *C*, only the skin is sutured.

thick crural fascia forms a veritable block between the two With fibrosis and matting of the sbucutaneous tissue as well as of the superficial layer of the deep fascia lymphatic drainage around the ulcer is definitely hampered Tissue fluids cannot drain cephalad through scarred subcutaneous tissue unless the barrier of the deep fascia is removed Removal of the deep fascia allows the muscular contractions to lend their beneficial pumping support to the remnants of superficial lymphatics and the veins Extirpation of fibrous matting from around the ulcer itself permits muscular tissue to come into direct contact with avascular skin Muscles are richer in arterial supply than fascia and can sprout granulations with greater ease and abundance After all it is vascular granulation which heals wounds and restores tissues to a healthy state and appearance

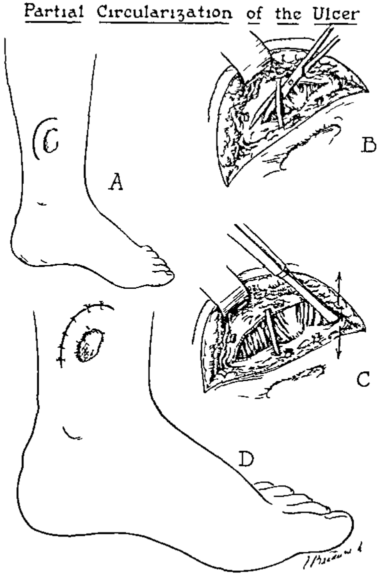

Fig 4—Crural fasciotomy and partial insulation of the ulcer bearing area *A*, an incision, somewhat semicircular, is drawn around the ulcer, about 1 cm above and behind its indurated border Lately we have been favoring incisions which are less circular and more oblique or longitudinal They are less likely to cause sloughs *B*, all the veins leaking into the ulcer by reverse flow are doubly ligated and cut between the ligatures If the ulcer is painful and the saphenous nerve is scar bound, the nerve is also severed Otherwise the saphenous nerve is left undisturbed and the crural fascia under it is slit transversely *C*, the deep fascia is then stripped up and down from the medial border of the tibia *D*, only the skin is approximated The skin in this potentially infected area is preferably sutured with wire

Management—The treatment of gravitational leg ulcers and allied conditions revolves around three basic tenets (*1*) vein ligation to stop reverse flow and break the long column of stagnant blood in the saphenous system into smaller segments (*2*) fasciotomy or fasciectomy, whereby the barrier between the muscular and subcutaneous compartments of the leg is removed so that superficial veins and lymphatics can benefit from the squeezing action of muscles and empty themselves upward against gravity, (*3*) pressure dressings to afford the ulcer and its surroundings rest and the limb uniform support and compression which the snug stocking of skin normally does in the young—before it has lost its turgor and has been pushed away from the deep fascia and the muscles within it by overfilled tortuous veins, deposits of fat stagnant fluid and products of inflammation

(*1*) *Segmental Vein Ligation* It is perhaps safer to disregard all previous attempts at high ligation of the saphenous vein and explore the groin To locate the saphenous vein below Poupart's ligament the surgeon uses whichever of his hands is contralateral to the patient's leg (right hand for right leg) He holds his hand as if writing with an imaginary pencil and sinks the tip of his ring finger into the groin of the patient, along the inguinal ligament, midway between the pubic crest and the anterior superior spine of the ilium With the ring fingertip he locates and feels the pulsations of the femoral artery On the outer side of the palpating digit lies the femoral nerve in line with the small finger, on the inner side, underneath the pulp of the long finger, passes the femoral vein, the index finger points to the femoral canal, and the thumb overlies the portion of the saphenous vein to be ligated (Fig 1A) An incision 2 to

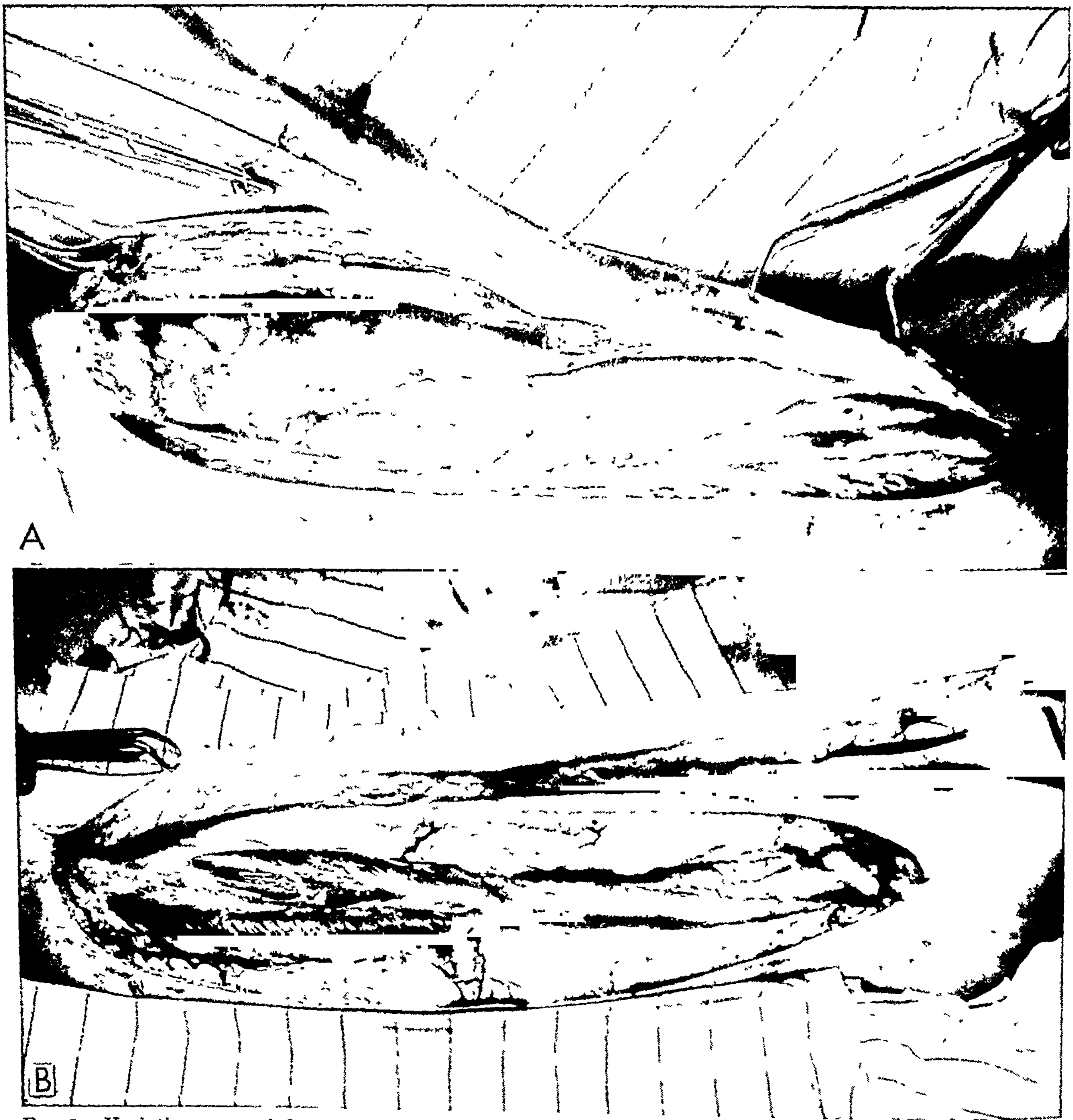

Fig. 5.—Variations: crural fasciotomy and fasciectomy through axially placed incisions. *A*, incision over the medial aspect of the leg removing a longitudinal strip of fascia. This operation is specially indicated where there is marked induration of the limb. *B*, incision over the lateral aspect of the leg excising a long elliptic segment of the skin, the underlying fat and the deep fascia; this is indicated in cases of elephantiasis. A similar procedure may be carried out three months later on the medial side.

3 inches (5 to 7.5 cm.) long and parallel to the inguinal crease is drawn through this point. The incised edges of skin are held up by noncrushing Allis forceps or towel clips. The upward pull of the skin away from the recumbent patient allows the saphenous vein to drop on the deep fascia, and the interval may be sharply cut through with impunity. The fibroadipose tissue surrounding the vein is cleared by blunt dissection, and the vein is delivered through the incision. The vein is clamped, pulled distally and dissected clean

until all its tributaries and its point of entrance into the deep femoral vein come into view. The tributaries are caught doubly, ligated and cut between the two ligatures. The saphenous trunk itself is ligated just distal to the saphenofemoral junction and about 2 inches (5 cm.) below and the intervening segment is resected. Only the skin is closed.

After high ligation the saphenous vein is again ligated below the bend of the knee distal to where it sends communicating branches to the short saphenous vein and the popliteal vein. Using the same hand for palpation the surgeon locates this point as follows: with the tip of the ring finger touching the inferior pole of the patella the palm is allowed to rest on the front of the proximal tibia with the thumb in abduction (Fig. 1*B*). An incision is drawn parallel to and a fingerbreadth above the volar surface of the surgeon's thumb resting on the patient's leg. This incision is in line with the normal skin crease below the knee. It starts at the inner border of the tibia and ends over the medial belly of the gastrocnemius muscle. Small venous tributaries underneath the skin are isolated and ligated and cut between the ligatures. The incision is deepened down to the fascia and the saphenous vein is dissected out. The vein passes obliquely from behind the region of the medial

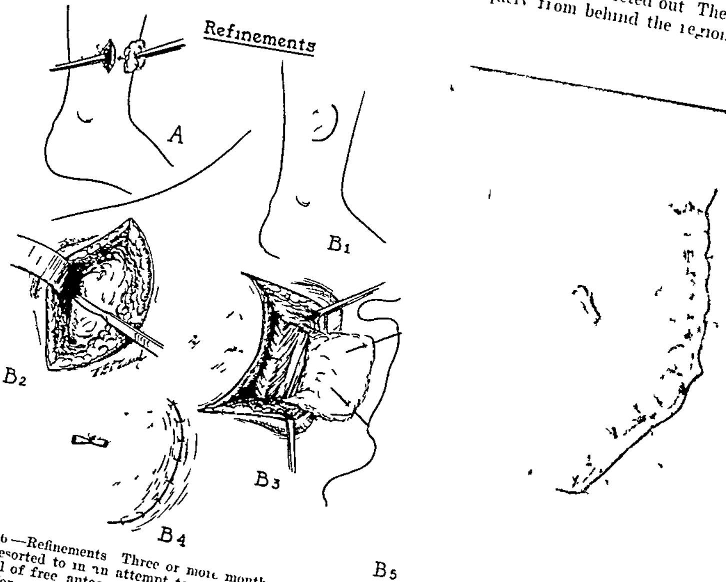

Fig. 6.—Refinements. Three or more months after the ulcer has completely healed, several operative procedures are resorted to in an attempt to pad adherent, painful or pruritic scars. *A*, demonstrates feeding of a small morsel of free autogenous fat through a small slit around the margin of the healed ulcer. B^1 indicates the incision for underlining the scar with a fascial flap. B^2 shows undercutting and lifting of the previously adherent scar. B^3, a pedicled flap is prepared from in front of the leg, utilizing the fascia which covers the extensor muscles of the toes and tibialis anticus. Its free lateral margin is secured by two needles bearing the same thread. B^4, the fascial flap is turned medially over its attached border, it is flattened and adjusted under the lifted scar, the needles are then passed outside the skin and the anchoring suture is secured to a rubber tubing at the base of the lifted scar. The skin is closed over the underlying fascial flap. B^5 illustrates B^4, which was actually performed.

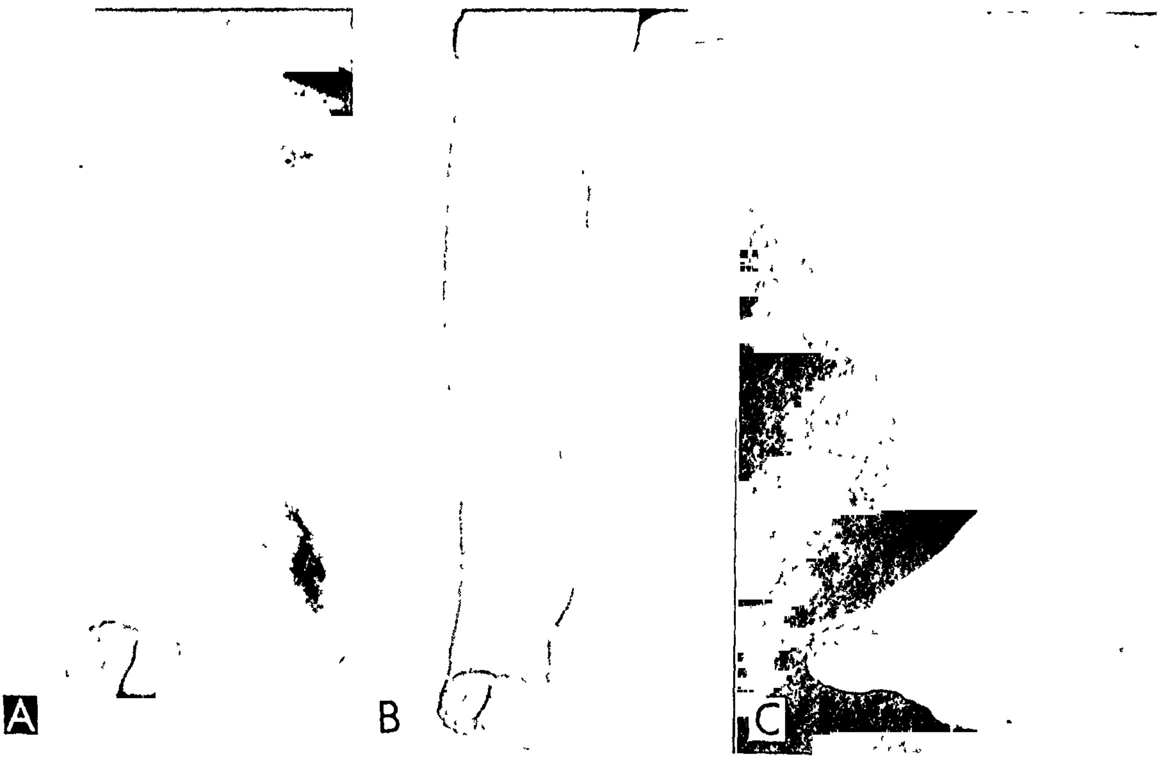

Fig. 7.—Boots and bandages. Supportive appliances are utilized as indicated. *A*, Unna's boot. *B*, mildly compressive elastic bandage over Unna's boot. *C*, plaster cast with walking heel applied over both Unna's boot and elastic bandage. The latter is especially useful for ulcers which are infected or are likely to be affected by the movements of the ankle.

condyle of the femur toward the inner border of the proximal tibia. The saphenous nerve traverses behind the vein, closer to the deep fascia. It need not be disturbed. The vein is caught, doubly ligated and the segment between the two ligatures is resected.

(2) *Crural Fasciotomy:* There are numerous instances in which adequate segmental vein ligation has already been performed but the ulcer, the surrounding induration and the swelling persist. The fact that by fasciotomy or fasciectomy, muscles can be delivered out of their tight compartments and allowed to impart their beneficial impulse to the superficial veins and lymphatics has not been sufficiently emphasized. Fasciotomy is initiated through the incision just described for ligation of the saphenous vein below the knee, and it is carried out at the same sitting as for segmental vein ligation. The deep fascia overlying the medial head of the gastrocnemius is slit wide open and the muscle belly is allowed to bulge into the subcutaneous space. The deep fascia is released from the intermuscular septum; its attachment to the medial border of the tibia is stripped as far down as the incision will permit. When the ulcer is low, nearer the tibial malleolus, the long saphenous is also ligated at the level of the midcalf as it courses down behind but superficial to the medial border of the tibia, a fingerbreadth away from it. Here too the crural fascia is detached from the medial border of the tibia (Figs. 2 and 3). About ½ inch (1.2 cm.) from the proximal pole of the ulcer another incision is made, which may run parallel to the incision below the knee or may partly circle the ulcer or its indurated border. Here too the incision cuts through skin and deep fascia, severing and ligating all the veins that lend to the ulcer. The deep fascia is then lifted by a periosteal stripper from the medial border of the tibia up in cephalad direction until it meets the facial detachment made by the proximal incisions; it is also unmoored from the intermuscular septum. Depending upon its viability, the proximal skin edge is undercut and the thickened fascia under it is removed. Because

of poor arterial blood supply the skin [illegible] and the ulcer is not undermined. Near the [illegible] where there is greater likelihood of inte[illegible] the edges of the skin are approximated [illegible] interrupted wire sutures, which are tie[illegible] a piece of black silk to aid identification. [illegible] to four weeks later when the sutures are removed (Fig. 4).

When the leg is extensively indurated fasciotomy is carried out through a long longitudinal incision along the medial border of the tibia. In the presence of varicose elephantiasis the redundant skin and the underlying fat and vein-bearing fascia are removed through an extensive axially placed longitudinal incision. Longitudinal incisions are also preferred when the circulation of the limb is precarious (Fig. 5).

Secondary surgical procedures in three to four months may or may not be indicated. Usually, when the ulcer overlies tendons or bony prominences, it heals with an adherent scar. It may cause contracture or pain. Cutaneous nerves traversing through the scar may have to be cut. There may be other veins around the uncut border of what was once an ulcer; these may keep the thin, scarred skin moist and itchy. It is then expedient to complete insulation of the ulcer-bearing area so as to sever any possible communicating veins which might feed the region by reflux. It is not beyond the ken of present day surgery to underlie the scarred skin with a fascial flap or even with free grafts of subcutaneous fat. After this second stage the principles of compressive boot or cast are observed and carried on until firm healing of the cutaneous edges is affected and swelling of the ankle has well abated (Fig. 6).

(3) *Supportive Dressings:* Casts, bandages or boots are applied immediately after operation, over the fine-meshed gauze, or on the following day. Usually the limb is encased in an Unna's boot which covers all the area from the base of the toes up to the level of the tibial tubercle. Unna's boot is reinforced by a mildly compressive [illegible] case

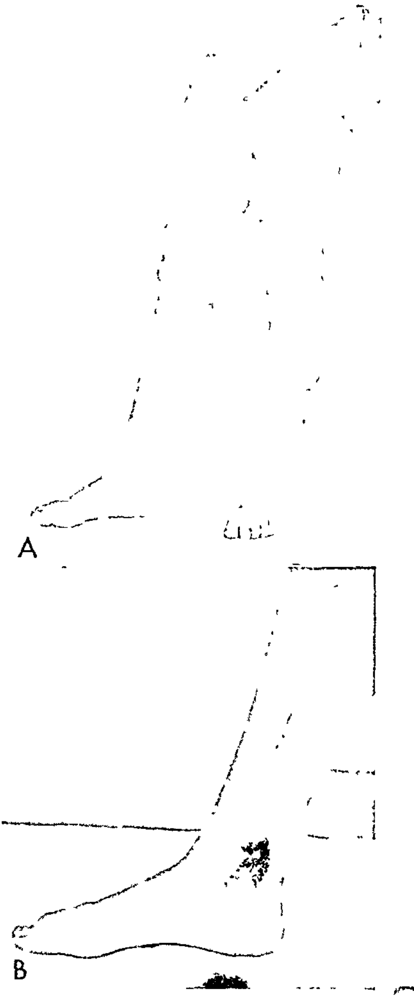

Fig. 8.—Ulcer overlying the flexor retinaculum of the ankle in a woman, aged 46. Previous treatments: periodic application of Unna's boot; elastic stockings and injections of sclerosing solutions. *A* shows the entire right leg with multiple incisions for segmental ligation of the long saphenous and crural fasciotomy. *B* represents the same six weeks later.

A

B

Fig. 9.—Ulcer overlying the tibial [illegible] of healed incision three months after [illegible]

tension and stress are anticipated [illegible] ments of the ankle. [illegible] leg plaster [illegible] a walking heel, or caliper [illegible] plied. The patient is all[illegible] bandages, boots or casts are [illegible] comes expedient, usually [illegible] the ulcer is epithelialized. [illegible] takes from two to four [illegible] upon the size of the [illegible] cers over the malleoli [illegible]

[illegible] agent [illegible] [illegible] the direction of the [illegible]

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COMMENT

There are several [illegible] troversy. One of these [illegible]

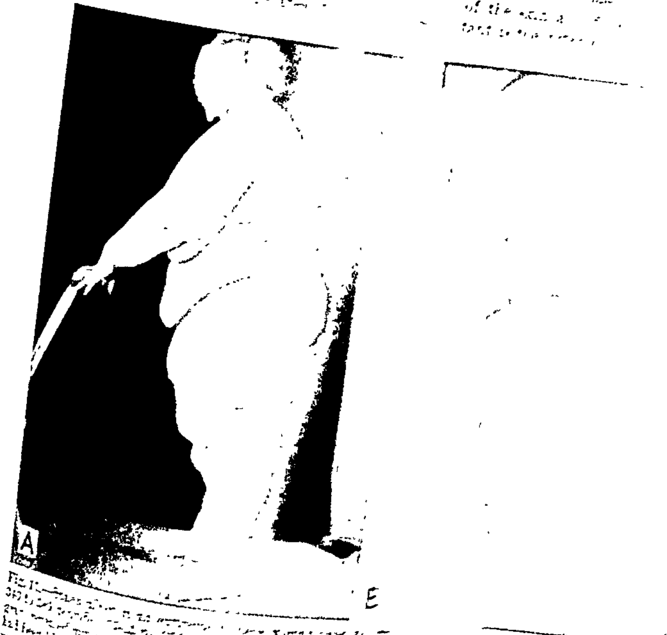

Fig. 1[illegible]—[illegible] woman aged [illegible] [illegible] obtained from the dorsalis pedis or the posterior tibial arteries and the appearance of the ulcer itself. In the presence of fresh thrombophlebitis involving the deeper veins and fulminant regional infections, operation is postponed. The limb is given cleansing care, wrapped with a mildly compressive bandage and elevated. When infection is moderate or quiescent and there are no reactions such as elevated temperature, the limb is encased in an Unna's cast and the patient is asked to return in a month. Mild infections, which almost invariably complicate varicose ulcers, are no contraindication to judicious surgical treatment. Thrombophlebitis of the superficial saphenae is best treated by high ligation, pressure bandages and ambulation.

A second controversial point pertains to the value of sclerosing solutions for gravitational ulcers. Sclerosing solutions are of benefit in causing occlusion of tortuous secondary saccules in the subcutaneous space. Their value in occluding the main stem of the saphenous vein is questionable. They do cause fibrosis of the superficial fascia, which may not have any deleterious effect on the ulcer if the injection is confined to the region of the thigh. Fibrosis of the superficial fascia of the lower part of the leg enhances neither the healing of the ulcer nor the associated lymphedema of the leg. It aggravates both.

Another debatable point concerns skin grafting in expediting the rapid healing of ulcers. Gravitational leg ulcers appear larger than they actually are, owing to the associated swelling of the leg. A pressure bandage, rest and elevation of the limb will reveal the actual size of the ulcer, which in most instances is too small to warrant skin grafting. Moreover, gravitational ulcers are comparable to burns;

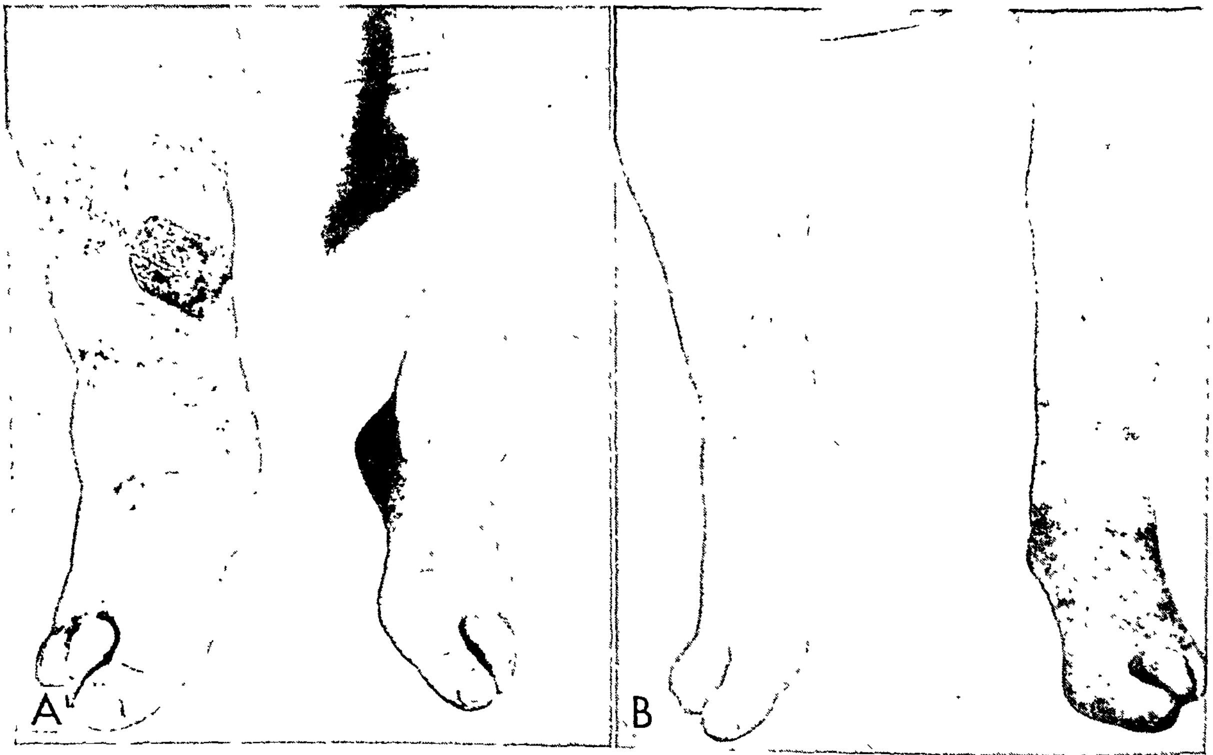

Fig. 11.—Large infected leg ulcer of many years' duration which had already caused extensive skeletal hyperostosis. The patient was a man, aged 60. About fifteen years ago he had a resection of the prostate gland which was followed by complete urinary incontinence and deep thrombophlebitis of the right leg. Later a large leg ulcer developed. No treatments were instituted except supportive bandages. *A*, both legs are here presented to show the comparative enlargement of the ulcer-bearing limb. It was deemed wise to postpone operation; the limb was encased in a snugly fitting short leg cast with a walking heel. Four weeks later, after removal of the walking cast, the ulcer had become much smaller and the leg was in better condition. Fasciotomy was then performed. *B*, the same, three months after surgical treatment.

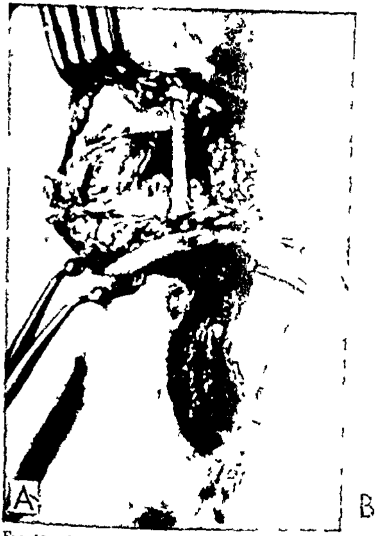

Fig 12—Extremely painful ulcer over the [illegible] the past several years? Previous treatment [illegible] strates the undercutting of the skin [illegible] sor group of muscles to bulge freely [illegible] trophied, scar bound, sensory terminal of the [illegible] sected *B* healed ulcer three [illegible] after [illegible]

a great many epithelial cells within the limits of the ulcer survive in pores and sweat glands and from these the denuded area epithelizes as fast as it would require skin grafts to thrive and 'take It should also be recalled that gravitational ulcers occur in the lower part of the leg overlie the distal portion of the tibia and occasionally extend backward and down overlapping the tendons of the tibialis posterior and flexor digitorum communis The area is poorly supplied by arterial twigs it is underlined by fibrous periosteum and avascular retinacula which hold the tendons close to the bone In order to create a favorable matrix for skin grafts one must remove the fibrous layer of the periosteum the deep fascia and its retinacular thickenings A split thickness graft even if it takes will adhere to bone and tendons, a full thickness free graft will hardly survive in a potentially *infected* area A pedicled flap crossed from the opposite limb may provide a padded covering and is feasible for the young Older patients who are more frequently afflicted with gravitational leg ulcers will not tolerate the contortion and strain which accompany the immobilization required for cross-leg flaps Then again skin grafting requires prolonged hospitalization and recumbency which in most instances is not economically feasible

There are finally several moot problems that need clarification One of these concerns ulcers which complicate old chronic phlegmasia alba dolens or phlebitis of the femoral vein It should be noted that by the time ulcers have developed in deep femoral obstruction compensatory anastomotic channels have already established themselves There is therefore no valid cont[illegible] judicious segmental ligation

Fig. 13.—Stasis elephantiasis with marked thickening of the subcutaneous fascia and moderate pigmentation of skin in a man, aged 64. Varicosities for twenty odd years. Previous treatments: sclerosing injections, over fifty of them; supportive stockings. *A*, leg before segmental vein ligation and crural fasciotomy. *B*, six months after operation through two elliptic incisions removing redundant skin subcutaneous veins and fat and a strip of fascia.

or to fasciotomy and insulation of the ulcer Another point which needs to be touched upon relates to the comparative benefit derived from various supportive appliances. The time-honored Unna's boot has no advantage over an ordinary elastic pressure bandage except for the fact that it is not removable; it necessitates infrequent dressing and disturbance of the wound. A good method is to put a thin layer of Unna's boot and apply a mildly compressive unifom elastic bandage over this, from the base of the toes up to the bend of the knee. When the ulcer is affected by the movements of the ankle it is best to incorporate a short leg cast with a walking caliper or heel.

SUMMARY AND EXTENSION

The pathogenesis and the management of gravitational leg ulcers are discussed, and several representative cases are appended in the accompanying illustrations. The treatment consists of three distinct, dovetailed procedures: (*1*) segmental ligation of the saphenae, usually the large; (*2*) crural fasciotomy, and (*3*) pressure dressings. Division of the long saphenous column into smaller segments partly alleviates the load sustained by overburdened valves; extirpation of the thick crural fascia removes the barrier between the scarred subcutaneous space and the lush muscular compartment. Healthy tissues are thus brought into contact with fibrotic ill-nourished skin; muscular contractions come to the aid of the sluggish lymphatic and venous flow within the subcutaneous tissue. The two procedures, vein ligation and fasciotomy, are both utilized in what amounts to a planned insulation of the ulcer itself An oblique or s[illegible] cision is made around the proxim[illegible] the ulcer 1 cm from its indurat[illegible] cutting through skin and fascia [illegible] the veins that might leak into th[illegible] area and partly extirpating the [illegible]

[illegible] months the circle [illegible] the ulcer may have [illegible] ments as paddin[illegible] [illegible] in order [illegible] through

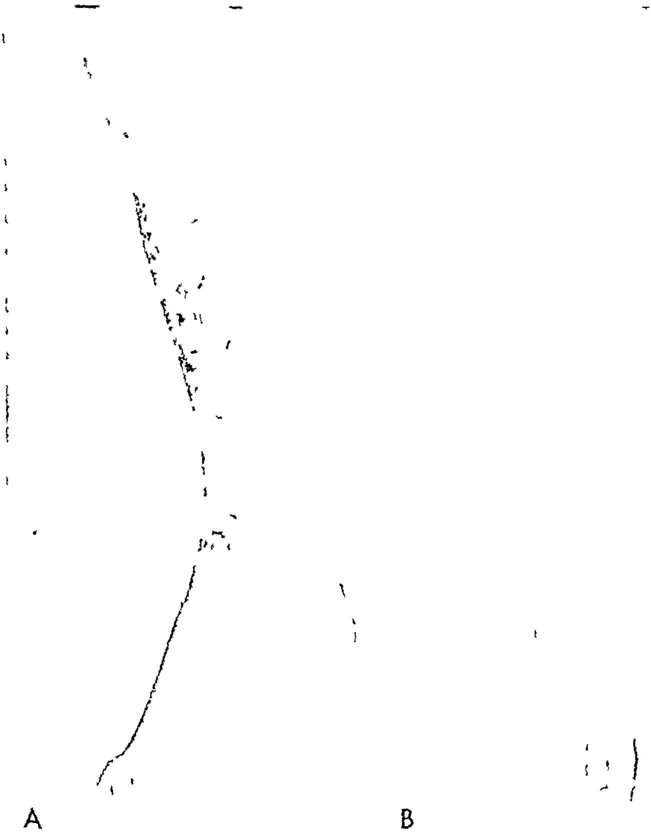

Fig 14—Stasis eczema and ulcer due to multiple operations for old osteomyelitis in a man aged [illegible] Osteomyelitis healed, leaving a markedly hypertrophied bone with a tense, fungating skin over it Through an axial incision fasciotomy and ostectomy was performed removing a longitudinal segment from the anterior aspect of the tibia diminishing the size of that bone *A*, before fasciotomy and ostectomy *B*, six [illegible]

to give the overlying skin a better substratum on which to survive.

9. Finally, there is the problem of stasis due to the lack of joint motion and muscular action. The condition is often seen after polyarthritis and in persons who have been subjected to prolonged recumbency and immobilization and then permitted to assume the upright position without supportive bandages. During their long illness and inactivity the muscles have atrophied and the joints of the lower extremity have become stiff. Crural fasciotomy will not benefit these patients so long as the joints remain ankylosed; muscles cannot contract and impart their beneficial squeezing action to the veins. Segmental ligation of the saphenous vein will convert a long stagnant column into several short ones, but so long as the muscles remain inactive stasis continues. One of the joints, preferably the knee, must be mobilized (Fig. 15).

RÉSUMÉ

Une discussion d'ulcères dus à la gravitation et aussi ceux dus aux autres etats est presentée, commanceant avec une description detailee des procédés pathologiques et aussi des procédés therapeutiques qui doivent etre employes: 1) ligature segmentaire des veines saphènes 2) compression des tissus 3) fasciotomie crurale. Plusieurs cas sont décrits, discutés et illustrés.

ZUSAMMENFASSUNG

Der Verfasser eroertert auf statischer Basis entstehende Unterschenkelgeschwuere und verwandte Zustaende. Er beginnt mit der Darstellung des allgemeinen chirurgisch-pathologischen Bildes und geht dann auf die Einzelheiten der Behandlung ein. Diese besteht aus drei verschiedenen ineinandergreifenden Verfahren: (1) segmentaere Unterbindung der Saphena, (2) Durchschneidung der Schenkelfaszie, (3) Druckverbaende.

Einige typische Faelle werden beschrieben und illustriert.

RIASSUNTO

Presenta una discussione di ulcere gravitazionali della gamba e stati alleati, principiando col quadro generale di patologia chirurgica e continuando le circostanze di conducimento. Il trattamento e composto di tre procedimento distinti, congiunti a coda di rondine; 1 legatura in semmento le vene safene, 2 fasciotomia crurale e 3 ovatte strette. Parecchi casi rappresentativi sono descritti ed illustrati.

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Growth and culture imply both activity and periods of leisure sufficient to absorb the results of this activity, using it to enrich art and manners and personality. The Athenians were quite right in believing that the final goods of life could not be achieved by anyone who was forced to spend the entire day in some spiritually deadening or physically exhausting task in the shop or on the farm; but it is equally true that the spiritual life itself suffers by complete divorce from the vivid experiences and the salutary restraints of practical activity.—*Lewis Mumford*

Chronic Arteriomesenteric Duodenal Ileus

DOUGLAS [illegible]

[illegible] FICS

THE disease called chronic [illegible]teric duodenal ileus is frequen[illegible] to as Wilkie's syndrome. Th[illegible] examples of chronic duodenal ileus: th[illegible] the arteriomesenteric, some congen[illegible] acquired. Examples of the congenit[illegible] obstructions due to a congenital b[illegible] megaduodenum comparable to the m[illegible] of Hirschsprung's disease. Exampl[illegible] acquired type are obstructions du[illegible] sions, tuberculous glands and neoplasms. Th[illegible] paper, however, will be confined to [illegible] mesenteric ileus.

Rokitansky[1] in 1863 was the first to [illegible] a case of duodenal dilatation due to compression by the mesenteric root. It was not until 1907, however, that Bloodgood in America suggested duodenojejunostomy for relief of the duodenal obstruction. A year later Stavely,[3] of Johns Hopkins, followed Bloodgood's suggestion and performed the first duodenojejunostomy for duodenal obstruction due to the mesenteric band. Wilkie[4] of Edinburgh in 1921 wrote extensively on the subject and in 1927[5] reported 64 cases in which the condition was treated by duodenojejunostomy. Since then numerous case reports and articles have appeared in the medical literature, but there is still considerable disagreement as to the etiology, incidence and surgical indications.

Incidence.—The incidence of this disease is difficult to estimate, but one can assume that the mild form occurs occasionally and the severe form rarely. The late Dr. Whitelaw, a roentgenologist of Vancouver, diagnosed Wilkie's syndrome twice in his last 1,000 roentgen examinations of the stomach and duodenum. A survey of hospital records in Vancouver showed that approximately 1 patient has been operated upon in every two months. One surgeon has operated upon 12 and another on 8 since 1946. One of the senior abdominal sur[illegible] has operated upon only 6 in [illegible] years of surgical practice, and an[illegible] operated for this condition I [illegible] upon 2 patients. [illegible] however, that the mild forms [illegible] are missed by clinicians and [illegible]gists. Surgeons, even with the pa[illegible] may miss it occasionally [illegible] follow the teaching of Moynihan[2] [illegible] abdominal operation should in[illegible] examination of the third part of the [illegible]

Physiologic Features.—The physiologic movements of the duodenum are complex. When the acid chyme of the stomach enters the duodenum the first part of the duodenum contracts and the second and third parts undergo peristaltic, antiperistaltic and segmental movements. The contents of the duodenum are thereby churned back and forth a few times before being passed into the jejunum. Normal activity is easily upset, however, by disease intrinsic or extrinsic to the duodenum. Hyperperistalsis and sphincter-like spasms of the circular muscles result in a writhing action of the duodenum. This type of upset may be a result of vagatonia. On the other hand, increased dilatation and stasis may be due to sympatheticotonia. Some claim that such physiologic disturbances provide the etiologic basis of Wilkie's syndrome; that is, they claim that the syndrome is neuromuscular in origin.

In my opinion, however, no neuromuscular disturbance in the duodenum is ever the primary cause of Wilkie's syndrome. The primary etiologic factor is a mechanical obstruction. The duodenum responds to an obstruction similarly to any other segment of the gastrointestinal system. At first it compensates by increased peristalsis, segmental movement and dilatability. Later, when hyperactivity gives way to paresis and dilatation, it becomes decompensated.

Anatomic and Etiologic Elements.—T[illegible] anatomic elements of the intestine and mesenteries are well known, [illegible]

Read at a meeting of the British Columbia Surgical Society, April 27, 1950.
Submitted for publication Nov. 20, 1950.

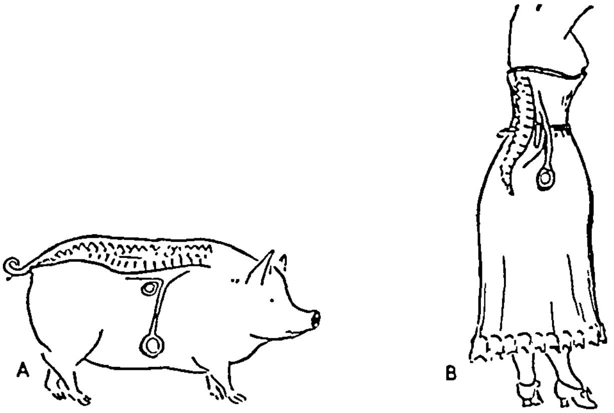

Fig. 1.—Sketch to differentiate conditions in the erect biped and the horizontal quadruped. In the human being the duodenum is vulnerable to compression by the mesenteric root; in the quadruped it is not. *(From Codman, E. A.: Chronic Obstruction of the Duodenum by the Root of Mesentery, Boston M. and S. J. 157:503, 1908.)*

of special interest are worth mentioning. The final stage in the embryologic rotation of the midgut fixes the horizontal part of the duodenum between the lumbar portion of the spine and the mesenteric root anteriorly. The mesenteric root or pedicle contains the superior mesenteric artery vein and nerve and crosses the horizontal or third part of the duodenum at its termination. The intermediate position of this part of duodenum renders it vulnerable to compression when for one reason or another the lumbar portion of the spine is prominent or the tension of the mesenteric pedicle is great.

It is of interest that the duodenum of the quadruped is not vulnerable to compression, because the drag of the intestine is ventral. In man, however, the drag is caudal in the erect position and ventral only when the all-fours or the knee-chest position is assumed.

Normally the mesentery of the small bowel has a broad posterior attachment, and the drag on the mesentery is therefore distributed over a broad base. Occasionally, however, the mesenteric attachment is poor and the drag of the small intestine is transferred to a narrow mesenteric pedicle. Occasionally, too, the right side of the colon lacks its posterior attachment, and its additional weight is added to the normal drag of the small intestine. A patient operated on at the Vancouver General Hospital in 1948, a woman aged 26, exhibited the anomalies just mentioned. At laparotomy the operating surgeon found no attachment of the small bowel mesentery to the posterior wall below the duodenum. The cecum and ascending colon had a mesentery and were excessively mobile. The drag of the small intestine and the right side of the colon rendered the mesenteric pedicle taut across the termination of the third part of the duodenum, and proximal to this the duodenum was tremendously dilated. The congenital anomaly of deficient mesenteric attachment is an exceptional cause of arteriomesenteric duodenal ileus, however, and must not be unduly stressed.

By far the commonest etiologic factor in the production of duodenal occlusion by the mesentric root is visceroptosis. In the presence of this condition the various ligaments and mesenteries become overstretched. In particular, the mesentery of the small intestine stretches to such an extent that the small intestine is prolapsed into the true pelvis. The mesenteric pedicle containing the artery vein and nerve, however, resists overstretching and becomes bandlike and taut. Usually, too, visceroptosis is associated with exaggerated lumbar lordosis, which predisposes still further to duodenal compression. At laparotomy the abnormal anatomic conditions are easily demonstrated. Traction on the mesentery for a moment is sufficient to dislodge the small intestine from the

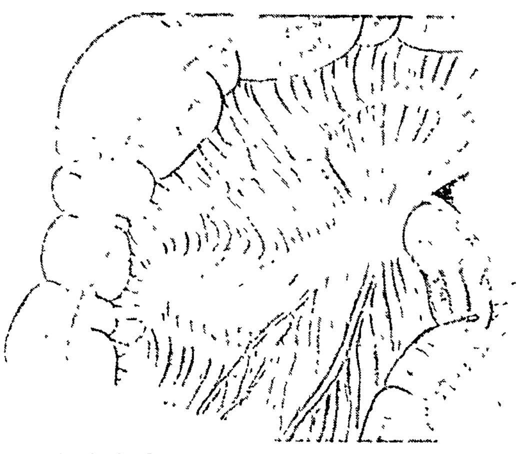

Fig. 2.—Artist's drawing. The dilated horizontal part of the duodenum presents as an oval mass when the transverse colon and the mesocolon are elevated. *(From Kellogg, E. L., and Kellogg, W. A.: Ann. Surg. 73:592, 1921.)*

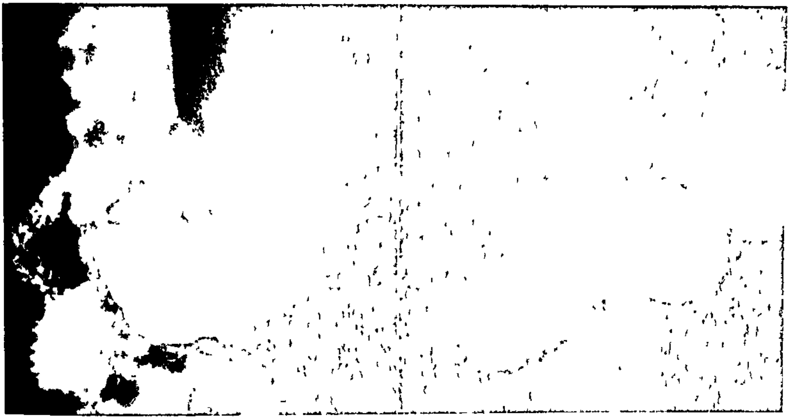

Fig. 3—*Left*, roentgenogram showing a duodenum with increased dilatability in its horizontal part, just proximal to the mesenteric root. Under the roentgenoscopic examination there was a marked writhing action within the duodenum, and the duodenal contents were churned back and forth eight to ten times before being emptied into the jejunum This is the commonest of all types and in the author's opinion should never be surgically treated *Right*, roentgenogram showing a moderately advanced state of duodenal obstruction The first and second parts of the duodenum appear normal, but the third part is greatly dilated and looks like an accessory stomach. Under these circumstances the emptying time is appreciably increased This condition usually requires surgical intervention to relieve the obstruction but a trial period of medical treatment, perhaps six months, should be instituted to establish the need of operation *(From Graham, R. R. Gastric and Duodenal Surgery Appleton Century, 1941, p 596)*

true pelvis, but continued traction causes the bowel to give with a pop as it leaves its resting place. Lifting the mesenteric band forward off a dilated and grooved duodenum allows it to empty.

Clinical Picture—The clinical picture, without roentgen evidence, is never sufficiently clear-cut to make possible a diagnosis of chronic arteriomesenteric ileus. A suspicion of the presence of the disease, however, may be aroused by consideration of the history, the type of patient and the symptoms The history invariably dates back many years, sometimes to childhood. It is essentially a record of attacks of indigestion and poor health alternating with periods of fairly good digestion and fairly good health The type of person most commonly affected is the person of so-called habitus asthenicus, with poor nutrition, visceroptosis and lordosis. More often than not the patient is a woman between the ages of 30 and 40 The indigestion is of the postprandial gaseous type, characterized by bloating, belching, flatulence and a sense of fulness Nausea and vomiting are common, as is pain, either aching or colicky Typically the indigestion is relieved by the knee-chest posture or the left-prone position.

Chronic ileus of any degree of severity may become acute and completely obstructive during periods of special stress, as during pregnancy or after an operation Patients hyperextended in the supine position for a fractured spine are ideal candidates for acute gastroduodenal dilatation.

Roentgen Data.—A roentgenologic consultation is essential to a positive diagnosis of duodenal obstruction due to the mesenteric band Ideally the roentgenologist is informed of the clinical suspicion that this disease exists, in order that he may employ a technic designed to demonstrate duodenal ileus. Ideally, too, the roentgenologist receives the patient during an attack of dyspepsia; otherwise the duoden

Fig. 4.—Roentgenogram demonstrating the advanced stage of Wilkie's syndrome. The pylorus is patulous, and the duodenum proximal to the mesenteric root is as large as the stomach. In such a case the delay in emptying is twelve hours. Surgical intervention is required to relieve the obstruction and should be undertaken as soon as the patient can be rendered fit.

structure and function associated with the milder types of this condition may appear normal. There are two important roentgen signs which are positive evidence of mesenteric duodenal ileus. One is delay in the emptying of the duodenum and the other is dilatation of the duodenum proximal to the point where the mesenteric pedicle crosses the termination of the horizontal part of this organ.

When the condition is advanced, the delay may be great. Bockus[7] reported a case with a forty-eight-hour delay and 2 cases with twenty-four-hour delay. The usual delay with the advanced condition is several hours, but with the moderately advanced type the delay is in terms of minutes and not hours. In the presence of the advanced condition the duodenum may be dilated to many times its normal diameter, and in many such cases the pylorus is patulous and the stomach dilated. The usual duodenal dilatation in cases of the moderately advanced condition is to twice the normal size. If both stasis and dilatation are marked, the roentgen diagnosis is easily made. There are many cases of mild involvement, however, in which the stasis is in terms of seconds and not minutes or hours, and the dilatation is rather an increase in dilatability. The most significant feature in these cases is the so-called writhing action within the duodenum.

Diagnosis.—The diagnosis of chronic arteriomesenteric duodenal ileus is to some extent arrived at by exclusion. Peptic ulceration, cholecystitis and chronic appendicitis must be ruled out. The first step in positive diagnosis of chronic arteriomesenteric ileus is the roentgen demonstration of a significant amount of stasis, dilatability, dilatation or writhing action in the duodenum. The second step is proof that the demonstrable duodenal obstruction is due to the mesenteric root and not to a congenital band, an adhesion or a neoplasm. When other disease can be excluded and the roentgen evidence is positive, then the history, the type of patient and the symptoms must be considered. All evidence being positive, a diagnosis of chronic arteriomesenteric duodenal ileus can be made with assurance.

The diagnosis, however, should be qualified by some term denoting the severity of the disease. Is it mild, moderate or advanced? The mild condition is that in which physiologic compensation for the obstruction is present. The moderate condition is associated with incipient decompensation. Hyperactivity is giving way to paresis and dilatation. Delay in emptying is moderate. In the advanced condition, marked decompensation is present. Paresis, dilatation and delay in emptying are well advanced.

Figure 4 shows a duodenum which exhibited an increased dilatability in its horizontal part, just proximal to the mesenteric root. Under fluoroscopic examination there was a marked writhing action within the duodenum, and the duodenal contents were churned back and forth eight to ten times before being emptied into the jejunum. This is the commonest of all types and, in my opinion, should never be submitted to operation.

Figure 5 demonstrates a moderately advanced state of duodenal obstruction. The first and second parts of the duodenum appear normal but the third part is greatly dilated and looks like an accessory stomach. Under these circumstances the emptying time is appreciably increased. This type of involvement usually requires surgical intervention to relieve the obstruction but a trial period of medical treatment, perhaps for six months should be instituted to establish beyond doubt the need of operation.

Figure 6 demonstrates the advanced stage of Wilkie's syndrome. The pylorus is patulous and the duodenum proximal to the mesenteric root is as large as the stomach. The delay in emptying is twelve hours. This condition requires operation to relieve the obstruction just as soon as the patient can be rendered fit to undergo it.

Treatment.—Medical treatment is the therapy of choice in all cases of mild arteriomesenteric duodenal ileus. Since the condition is assumed to be a complication of visceroptosis, treatment is directed mainly toward correction of this condition. Physiotherapy, abdominal support and attention to malnutrition do much to alleviate visceroptosis. Assumption of the knee chest position at intervals after each meal is of great assistance. Patients with moderate involvement may require operation but a trial period of medical treatment, perhaps for six months, should be instituted to establish the fact. Patients with the advanced condition must be treated surgically, but some may require considerable preoperative care to render them fit for surgical treatment.

At laparotomy the operating surgeon performs a thorough exploration and demonstrates obstruction of the third part of the duodenum by the mesenteric root.

The corrective operation is a straightforward procedure that short circuits the obstruction. The transverse portion of the colon is drawn through the incision and elevated. The bulging third part of the duodenum is exposed. The peritoneum over it is incised, and the duodenum is thoroughly mobilized. The first loop of the jejunum some 6 to 8 inches (15.2 to 20.3 cm.) from the duodenojejunal flexure is then anastomosed to the mobilized duodenum in a retroperistaltic manner.

On completion of the operation the edges of the incised peritoneum are sutured to the duodenum so as to keep the anastomosis within the peritoneal cavity. Occasionally the presence of cholecystitis or a peptic ulcer makes an additional operation necessary.

Postoperative care is conducted along the same lines as for gastrojejunostomy.

Prognosis.—The prognosis of Wilkie's syndrome in its mild forms treated medically is quite good. The prognosis of the moderate forms however depends upon the wisdom shown in selecting the form of therapy. The prognosis of advanced Wilkie's syndrome treated surgically is good unless concomitant disease counteracts an otherwise favorable surgical result.

SUMMARY

1. The mild form of chronic arteriomesenteric duodenal ileus occurs occasionally and the severe form rarely. Approximately 1 patient every two months is operated upon in the city of Vancouver.

2. The disease in a great majority of cases is a complication of visceroptosis, occasionally however it is a complication of a congenital anomaly such as a poor mesenteric attachment. Obstruction of the duodenum is brought about by a taut arteriomesenteric band compressing the termination of its horizontal part.

3. The diagnosis is suggested by the history, the type of patient and the symptoms

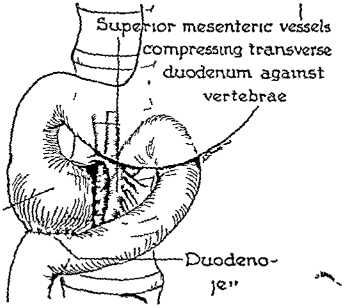
Superior mesenteric vessels compressing transverse duodenum against vertebrae
Ileus
Duodeno-
je

Fig 5—F [illegible] d by R

but roentgen evidence is essential to the diagnosis. Positive roentgen evidences of obstruction are excessive retroperistalsis, stasis, excessive dilatability and dilatation proximal to the point where the mesenteric root crosses the duodenum. It should be determined whether the disease is mild, moderate or advanced.

4. The treatment of the mild condition is medical. The moderate type is given a trial of medical treatment before surgical intervention is decided upon. The advanced condition is best treated surgically. Laparotomy should be performed, with a thorough exploration, the establishment of a duodenojejunostomy and the occasional addition of surgical procedures directed towards the cure of concomitant disease, such as peptic ulceration or cholecystitis.

5. The prognosis of chronic arteriomesenteric duodenal ileus is, as a rule, favorable if, proper treatment is given.

RÉSUMÉ

1. La forme légère de l'iléus duodénal arterio-m mésenterique chronique survient parfois. La forme chronique est plus rare. Un malade est opéré tous les deux mois pour cet état dans la ville de Vancouver.

2. La maladie dans la grande majorité des cas est un une complication de la visceroptose; parfois c'est une complication d'une anomalie congénitale, tel qu'un attachment mésentérique trop restreint. L'obstruction du duodénum est determiné par une bande arteriomesentérique trop serré qui comprime la terminaison de la partie horizontale du duodénum.

3. Le diagnostic est suggéré par l'histoire, le type du malade et les symptômes; mais neanmoins, l'evidence roentgenlogique est essentielle pour le diagnostic. Les témoignages positifs sont le retroperistaltisme excessif, la stase, la dilatibilité excessive et la dilatation proximale au point ou les racines mésenteriques compriment le doudenum. Il faut déterminer si la maladie est légère, modérée ou avanceé.

4. Pour les obstructions légères, on emploiera le traitement médical. Pour le type modéré, on essai era avec le traitement médical avant d'intervenir chirurgicalement. Pour les cas avancés, on fera une laparotomie, on explorera l'abdomen, on créera une duodénojéjunostomie, on ajoustera toute mesure churgicale ayant pour but la guérison de maladie concomitante, telle qu'ulcère peptique, cholecystite etc.

5. Le pronostique de l'ileus dû a l'arteriomesenterique chronique duodénal, est favorable si on emploi le traitement approprié.

ZUSAMMENFASSUNG

1. Der chronische arteiomesenterische Zwoelffingerdarmileus kommt in seiner leichten Form gelegentlich und in seiner schweren Form selten vor. In der Stadt Vancouver gelangt etwa alle zyei Monate ein Kranker zur Operation.

2. In der grossen Mehrzahl der Faelle stellt die Erkrankung eine Komplikation einer Visceroptose dar. Gelegentlich aber tritt sie als Komplikation einer angeborenen Anomalie wie zum Beispiel einer unzureichenden mesenterialen Befestigung auf. Zur Abklemmung des Zwoelffingerdarms kommt es durch Druck eines straffen arteriomesenterialen Bandes auf das Ende des horizontalen Duodenalabschnittes.

3. Die Diagnose wird durch die Krankheitsgeschichte, den Typus des Patienten und die Symptome angedeutet, aber der Roentgennachweis ist wesentlich zur Erkennung der Krankheit. Positive Roentgenzeichen der Obstruktion sind: uebermaessige rueckläeufige Peristaltik, Stase, aussergewoehnliche Dehnbarkeit und Erweiterung oral von der Stelle, wo die Mesenterialwurzel den Zwoelffingerdarm kreuzt. Es sollte festgestellt werden, ob ein leichter, maessiger oder vorgeschrittener Krankheitsfall vorliegt.

4. Die leichen Faelle werden medizinisch behandelt. Der maessig schwere Typus wird erst einem Versuch medizinischer Behandlung unterzogen, ehe man sich zum chirurgischen Eingriff entschliesst. Fuer die schweren Faelle ist die chirurgische Behandlung die beste. Es sollte eine Laparotomie mit sorgfaeltiger Explorierung und eine Duodenojejunostomose ausgefuehrt und gelegentlich zusaetzliche chirurgische Eingriffe vorgenommen werden, um Begleiterkrankungen wie peptische Geschwuere oder Gallenblasenentzuendungen zu beseitigen.

5. Die Prognose des chronischen arterio-

mesenterialen Zwoelffingerdarmverschlusses ist, wenn geeignete Behandlung erfolgt, in der Regel guenstig.

RESUMEN

1. La forma benigna del íleo duodenal arteriomesentérico ocurre ocasionalmente y la forma grave raramente. En la ciudad de Vancouver se opera un paciente cada dos meses aproximadamente.

2. La enfermedad es en gran mayoría de casos complicación de visceroptosis pero ocasionalmente es complicación de una anomalía congénita como una deficiente inserción mesentérica. La obstrucción duodenal se produce por una brida arteriomesentérica que comprime reiteradamente la terminación de su parte horizontal.

3. El diagnóstico se hace por antecedentes, tipo del paciente y sintomatología, pero la evidencia rontgen es esencial para el mismo. Evidencias rontgen positivas de obstrucción son retroperistaltismo excesivo, estasis, dilatabilidad excesiva y dilatación proximal al punto en que la raíz mesentérica cruza el duodeno. En virtud de esto se determina si la enfermedad es benigna, moderada o avanzada.

4. El tratamiento del estado benigno es médico. El tipo moderado debe tratarse médicamente antes de decidir la intervención quirúrgica. El estado avanzado es mejor tratarlo quirúrgicamente. Debe efectuarse laparotomía, exploración completa, duodenoyeyunostomía y la adición ocasional de procedimientos quirúrgicos para el tratamiento de enfermedad concomitante, como ulcera péptica o colecistitis.

5. Si se hace tratamiento adecuado es generalmente favorable el pronostico del íleo duodenal arteriomesentérico.

RIASSUNTO

1. La forma soave cronica d'ileo duodenale arteriomesenterico occorre occasionalmente quella severa raramente. Approssimatamente I paziente ogni due mesi é operato nella città di Vancouver.

2. La malattia nella maggioranza dei casi a una complicazione di visceroptosi occasionalmente intanto di anomalo congenito tale che un attaccamento indigente mesenterico. Ostruzione del duodeno si compiere presso d'una striscia stretta ristringendo la limite della parte orizzontale.

3. La diagnosi e suggerite nella maggioranza dei casi dalla storia, il tipo di paziente ed i sintomi ma l'evidenza dei raggi X é essenziale per la diagnosi. Prova assoluta dimostrata dai raggi X del imbarazzo sono retroperistalsi, stasi dilatabilita e dilatazione eccessivo prossima la punta del traverso della radice mesenterico al duodeno. Si determina che la malattia sia indulgente moderata od avanzata.

4. Il trattamento della condizione debole e'medicale. Al tipo moderato si da un saggio medicale prima del intervento chirurgico sia deciso. Il miggliore trattmento per la condizione avanzata é la chirurgia. Effettuare laparatomia con esplorazione intero lo stabilimento del duodenodigiunostomia e casualmente aggiungere un modo di procedere diretto alla cura delle malattie concomitanti simile al ulcerazione peptico e oppure colecistite.

5. La prognosi d'ileo duodenale arteriomesenterico cronica come regola e favorevole dato trattamento corretto.

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Lipoma of the Colon Simulating Carcinoma

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PHILADELPHIA

ALTHOUGH once considered a clinical and pathologic oddity, lipomas of the colon are comparatively common, occurring next in frequency to benign adenomas. Bauer,[1] in 1757, was the first to record accounts of lipomas of the gastrointestinal tract. Hiller,[2] in 1899, studied a series of 23 cases, and since that time there have been numerous reports in the literature. Stetten,[3] in 1909, cited 72 cases of gastrointestinal lipoma, in 32 of which the lesions were in the colon, while Comfort,[4] in 1931, presented 28 additional cases, making a total of 181 up to that time; 92 lipomas were in the colon, 65 in the small bowel and 22 in the stomach. Poston,[5] in 1934, brought the total number of cases to 242, while Schottenfeld,[6] in 1943, added 6 cases of his own, increasing the total number of reported clinical and necropsy cases to 275; of these, 121 were cases of lipoma of the colon.

Incidence.—With regard to the colon itself, several noteworthy contributions have been made. Pemberton and McCormack[7] analyzed 7 clinical cases in which symptoms had been produced by the tumor. They stated that "excluding adenomatous polyps, lipomas are the most common tumors of the gastrointestinal tract." Gault and Kaplan[8] presented 14 instances of colonic lipoma and stated as follows: "Benign tumors of the colon are comparatively rare. Of these, lipoma is the second most common tumor." Browne and McHardy,[9] in 1944, reported 5 examples of their own and listed 130 from the English literature. Runyeon,[10] in 1946, added 2 cases and reviewed 121 satisfactorily studied clinical ones, while Pack and Booher,[11] one year later, gathered 153 cases of submucous lipoma of the large intestine from the literature and contributed 2 of their own. Long, Dockerty and Waugh[12] found 33 instances of lipoma of the large bowel in a survey of 125,000 laparotomies and stated that, since these were all clinical cases, their survey probably represented a concise account of the actual frequency of these tumors in surgical practice. Mayo and Griess[13] in 1949 reported 19 cases, bringing to 43 the number of operations performed for this condition. Comfort[4] found that in a study of 3,924 necropsies the incidence of lipoma of the colon was 0.5 per cent, while Kirschbaum[14] detected an incidence of 0.2 per cent in 5,724 clinical examinations, indicating that many lipomas may be silent. Comparing this percentage to data on adenomas, Saint[15] discovered only 2 lipomas in contrast to 36 adenomatous polyps in a series of 44 benign polypoid lesions of the colon.

Location.—The previous studies have indicated that lipomas are more frequent in the colon than anywhere else in the gastrointestinal tract. With regard to the different portions of the large intestine involved, in order of frequency, these tumors are found in the cecum, the ascending colon and the sigmoid colon, about 50 per cent occurring in the right half of the colon.[16] Boyd[17] stated that the predominant ileocecal frequency is due to the local inflammation and irritation so common in this region. Pemberton and McCormack,[7] in 102 cases, observed 29 lipomas in the cecum, 21 in the ascending colon, 15 in the transverse colon, 14 in the sigmoid flexure, 12 in the rectum and 11 in the descending colon. Runyeon,[10] in 109 instances in which definite localization was possible, found 51, or 46 per cent, in the cecum and ascending colon, an approximate length of 25 cm.; 17, or 16 per cent, in the transverse colon, measuring 50 cm., and 41, or 38 per cent, in the left half of the colon, a distance of 85 cm. This study shows lipoma of the right half of the colon to have a relative incidence of six times that of the same tumor in the transverse portion of the colon and four times its incidence in the left half.

Pathogenesis.—The etiologic background of intestinal lipoma is still unsettled. As has been mentioned, Boyd[17] has stated that inflammation and irritation may play a role, especially in the ileocecal region. Other theories have been advanced. Minelli[18] expressed the opinion

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TABLE 1 *(Runyeon)—Procedures for Removal of Lipoma of Colon*

Location	Anal removal	Spontaneous passage	Colostomy Resection	Colotomy Excision Closure	Resection	Colostomy	Total
Rectum	10	2	1	0	0	0	13
Sigmoid	3	2	0	2	6	1	14
Descending colon	2	0	0	4	7	1	14
Transverse colon	0	1	0	4	12	0	17
Ascending colon	0	0	0	4	15	0	19
Cecum	0	0	0	14	18	0	32
Presumably colon	1	7	0	0	1	0	9
Total	16	12	1	28	59	2	118

that these tumors are the result of degenerated connective tissue, while Cicala[19] suggested that they arise as a result of perivascular infiltration in the fibrous trabeculae On the other hand, Alevoli[20] concluded that a deposit of fatty tissue results from maldevelopment in the lymphatic supply and muscular circulation of the tissues whereas Borst[21] considered lipomas the consequence of metaplasia of common connective tissue into the adipose variety Geschickter[22] stressed the association of lipoid tissue with lymphatic tissue, pointing out that the distribution of many benign solitary lipomas in the interscapular region corresponds to a peculiar mass observed in the embryo, composed of vascular lymphoid tissue and containing many fat cells In other regions of the body this same association apparently occurs, and he concluded that lipomatous tumors in general probably follow the same distribution as lymphatic cysts He further stated that both lymphoid and lipomatous tissue develop late in the course of evolution and late in embryonic life, the transformation from connective tissue to xantholipoma to fat occurring after the sixth month and being very active just before birth In addition, he expressed the opinion that the further development of fat in later life is under hormonal influence, which is variable but probably derived from more than one source, the chief of which are the anterior lobe of the pituitary gland, the sex glands of internal secretion, and a related chorionic hormonal substance, "prolan," present in the urine of pregnancy Concerning the pathogenesis of these tumors, Long and his co workers[17] stated that there is good evidence that adipose tissue is not merely connective tissue containing fat but is a part of the reticuloendothelial system and is a specialized organ They pointed out as others have done that lipomas appear to spring from deposits of adipose connective tissue in the submucous and subserous zones of the colon

Pathologic Picture—Histologically, lipomas are well differentiated benign tumors composed of adult fat cells enclosed in a capsule In the colon they are of two types, submucous (90 per cent) and subserous (10 per cent) They usually occur singly but may be multiple, and the two kinds may be found together Comfort[4] observed 7 cases of combined lesions and 13 of multiple tumors, the latter as a rule being of the submucosal variety The subserosal tumor generally arises from the appendices epiploicae and may attain huge proportions before it produces symptoms The submucosal kind, on the other hand, arises when a cluster of fat cells or a minute lipoma herniates along with the submucosa into an infolding of the mucosa They may be sessile or pedunculated and vary in size from microscopic collections of fat cells to large polyps However, this variety rarely attains a large size, owing to the symptoms produced by obstruction to the lumen Comfort[4] found that the symptomatic tumors averaged about 8 cm in diameter Pedunculated growths are the result of peristalsis and the irritation of the passing intestinal content, and the well developed ones are covered by a thin atrophic mucosa with a barely perceptible muscularis mucosae

Complications and Symptoms—Submucosal lipomas commonly produce complications, the chief of which are irregular and forceful peristalsis, obst [illegible] and intussuscep tion. They may undergo spontaneous expulsion or circulatory changes resulting in edema, hemorrhage, cystic degeneration, necrosis, ulceration or sloughing. Comfort[4] and Pemberton and McCormack[7] reported a 50 per cent incidence of intussusception. Manheim and Peskin[23] observed 20 cases of spontaneous expulsion of intestinal lipomas. The subserous variety, on the other hand, produces complications by direct compression or, if pedunculated, by traction on the pedicle.

The symptoms of colonic lipomas are variable, and there is no specific clinical picture. The size, location and behavior of the tumor determine the time of onset of the symptoms, which are secondary to the complications mentioned above: namely, disordered peristalsis, obstruction, intussusception, ulceration and circulatory injury. The symptoms, therefore, are simply those encountered in the presence of any colonic tumor, benign or malignant. Long and his collaborators[12] and Pemberton and McCormack[7] noted an average duration of thirty-eight and four tenths and forty-one and five tenths months respectively, while one of us (H. E. B.) has reported an average of nine and three-tenths months in cases of malignant colonic disease.[24] Browne and McHardy[9] recorded an incidence of pain in 75.2 per cent of cases, a palpable tumor in 74.2 per cent, constipation in 55.4 per cent, weight loss in 14.6 per cent and bleeding sufficient to produce anemia in 7.9 per cent. However, the profound anemia associated with carcinoma of the cecum has not been observed. Diarrhea or constipation alternating with diarrhea may occur. With regard to location. Comfort[4] detected symptoms in 75 per cent of cecal lesions; 79 per cent of those in the ascending colon, and 90 per cent of those occurring in the transverse and sigmoid portions of the colon. In this respect, Browne and McHardy[9] stated: "Statistically at least, with pain and a mass in approximately 75 per cent of cases, with the lesion most often in the right colon, with long duration yet without anemia, we should in most instances venture a diagnosis of benign lesion."

Diagnosis.—A positive preoperative diagnosis of colonic lipoma is seldom made. In the series reported by Long and his associates,[12] a specific diagnosis of lipoma was made only once, although in 2 cases the roentgenologic report mentioned the likelihood. As a rule it is not possible for the roentgenologist to distinguish between the various histologic types of benign polypoid neoplasms. However, Weber[25] has pointed out that adipose tissue is the most radiolucent of all body tissues and has suggested that a polyp which fails to manifest the usual density on pneumograms may be a lipoma. On the other hand, as was stated by Browne and McHardy,[9] "actually it is more likely that the findings will lead to a diagnosis of carcinoma of the colon." In Long's series[12] a diagnosis of "polypoid lesion," "intussuscepting lesion," or just "lesion" of the specific part of the large bowel was made in 10 cases, while in 14 cases the roentgenologic diagnosis was carcinoma of the colon.

Proctoscopic examination may reveal the presence of a single pedunculated mass that appears yellowish and smooth, soft and superficially ulcerated. However, changes secondary to vascular disturbance frequently alter the appearance of the lesion, and a correct diagnosis is usually not made except at operation. Of course, positive results of a biopsy at proctoscopic investigation would be conclusive, but Browne and McHardy[9] did not encounter a single such lesion in 6,570 consecutive examinations, in which 66 carcinomatous and 108 adenomatous polyps were observed.

Treatment.—The treatment of colonic lipoma is surgical. Browne and McHardy[9] stated: "Since submucous lipomas in the colon do not manifest themselves in any specific fashion and though histologically benign, they are not clinically so when they become symptomatic nor in their potentialities even though asymptomatic, the only therapeutic approach is surgical." If, on exploration, inspection and palpation give indications of a benign tumor, colotomy with incision, enucleation and suture may be done if the growth is confined to the wall; or, if it is pedunculated, simple excision and ligation of the base may be employed. However, since the exact nature of the lesion is often difficult to determine, segmental resection with primary anastomosis is the procedure usually advocated, provided, of course, that the bowel has been properly prepared and that obstruction is not present In these events a staged procedure may be required, with a proximal colostomy or a modified Mikulicz type of operation Runyeon[10] in his series of collected cases has outlined the procedures employed for removal of lipomas from the colon (see Table 1)

In Long's group[17] a right colectomy was done in 15 cases in 6 of which the lipoma was associated with a carcinoma, exteriorization operations were performed in 8 cases, transcolonic removal in 5 cases, resection with primary anastomosis in 3, and combined abdominoperineal resection in 2 both times for carcinoma, the lipoma being incidental

REPORT OF CASE

C S, a 77 year old white man, was admitted to Temple University Hospital on July 18, 1950, complaining of dizziness high blood pressure and a rectal abscess He stated that for about two years he had suffered from transient dizzy spells and had had hypertension for many years He had noted a clear discharge from the left ischiorectal region intermittently for twenty years His breasts had been large for several years but had increased noticeably in size during the past two years For the past ten months he had complained of a vague aching pain in the right lower quadrant of the abdomen He had had no rectal bleeding or change in bowel habit The past medical history and family history were noncontributory

Physical examination revealed the patient to be obese, with a blood pressure of 176 systolic and 100 diastolic There was bilateral gynecomastia, the right breast being larger than the left, with a suggestion of a freely movable encapsulated, nontender mass within the breast tissue No axillary nodes were palpable The remainder of the examination gave essentially negative results except for some pallor of the mucous membranes and a fistula in ano with a chronic ischiorectal abscess on the left side No masses were felt in the abdomen

Laboratory studies revealed a hemoglobin level of 10 2 Gm, an erythrocyte count of 3 800,000 per cubic millimeter of blood and a color index of 0 87 The stools gave a moderately positive reaction for occult blood An electrocardiogram showed evidence of myocardial disease with right bundle branch block

Proctosigmoidoscopic investigation to a distance of 22 cm gave essentially negative results An upper gastrointestinal series revealed nothing significant Because of the unexplained secondary anemia, occult blood in the stool and the history of vague right lower quadrant pain, a barium enema with air contrast studies was carried out and reported as follows "With the aid of the Bardex catheter, the barium enema was administered under fluoroscopic control There was no obstruction to the retrograde flow of the barium mixture and all parts of the colon and a portion of the terminal ileum were filled The sigmoid, transverse and descending portions of the colon show smooth margins and normal haustral pattern On the lateral margin of the midportion of the ascending colon we note a smooth spherical filling defect which measures about 4 by 3 cm This filling defect is rather [illegible] demarcated on the air contrast studies, [illegible] lesion has the appearance of an [illegible] broad base (Fig 1) [illegible] satisfactory, and [illegible] a spherical pressure [illegible] in the midport[illegible] the previously [illegible] The significant [illegible] is the presence [illegible] of the [illegible] of an aden[illegible] sidered [illegible]

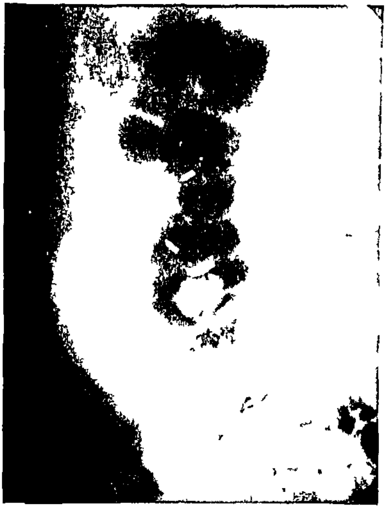

Fig 1 —Polypoid filling defect visualized in midpart of ascending colon on double contrast film The relative radiolucency of the tumor is noted

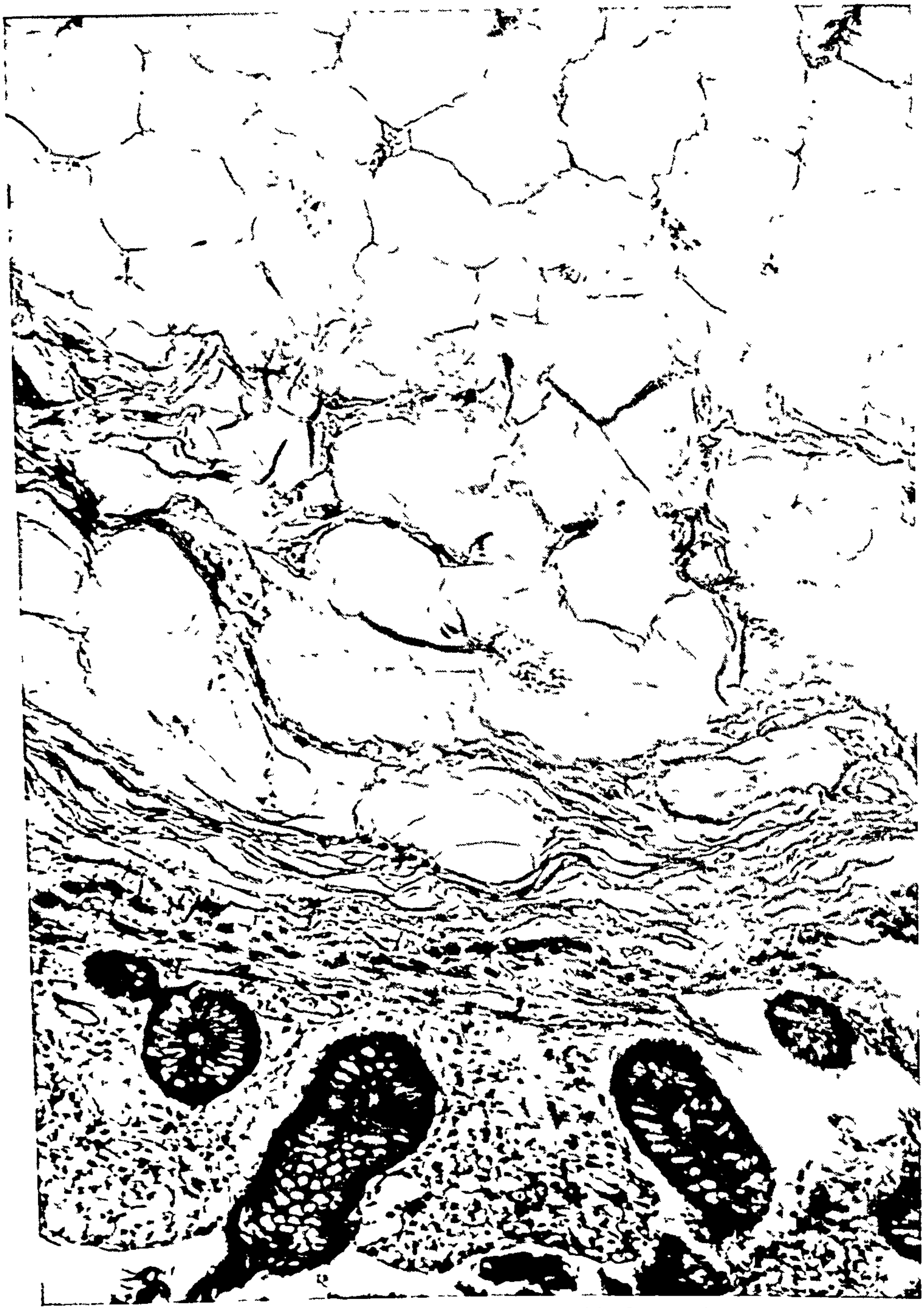

Fig. 2.—Section showing adult fat cells beneath a thin layer of mucosa and muscularis mucosae.

The patient was therefore operated upon, after due preparation of the colon, with a preoperative diagnosis of polypoid lesion of the ascending colon. At exploration, the right colon was mobilized and a soft, freely movable mass about the size of a walnut was palpated in the midpart of the ascending colon. It appeared to be attached only to the mucosa and could be moved proximally and distally for a distance of several centimeters. Consequently an incision was made in the bowel and a soft, smooth, yellowish, pedunculated tumor mass was delivered As the pedicle was long, the lesion was removed by simple division and ligation of the base

The pathologic report was as follows "The specimen consists of a well circumscribed fatty mass 3 2 cm in diameter, attached to a pedicle The sections show a neoplasm consisting of adult fat The bowel mucosa is stretched over one surface Diagnosis Lipoma of the colon" (Fig 2)

SUMMARY AND CONCLUSIONS

1 A case of lipoma of the ascending colon associated with bilateral gynecomastia is reported

2 Lipoma of the large intestine is second in frequency only to adenoma and should be considered in the differential diagnosis of tumors involving the colon

3 The etiologic pathologic and symptomatologic aspects of colonic lipoma are discussed

4 Lipomas occur most frequently in the cecum and ascending colon and may simulate carcinoma Secondary anemia of unexplained origin should direct one's attention to the proximal portion of the colon though our patient did not present the profound anemia associated with malignant change involving this region

5 Patients with vague gastrointestinal complaints should undergo careful roentgenologic investigation, as many lesions in the right side of the colon may be relatively asymptomatic

RÉSUMÉ

1 Un cas de lipome du colon ascendant associe avec gynécomastie bilatérale est rapporté

2 Le lipome du gros intestin est second en fréquence seulement a l'adénome et doit être considéré dans le diagnostic différentiel des tumeurs intéressant le colon

3 L'etiologie, la pathologie et les symptômatologies du lipome du colon sont discutées

4 Le lipome survient le plus fréquemment dans le colon ascendant et peut simuler le carcinome L anemie secondaire d'origine inconnue doit diriger l'attention a la portion proximale du côlon, quoique le malade dont nous rapportons le cas ne presentait pas la profonde anémie généralement associee aux tumeurs malignes de cette région

5 Les malades se plaignant de troubles gastriques intestinaux très vagues devraient etre examinés aux rayons X car beaucoup de lesions du côte droit du côlon sont relativement asymptomatiques

RIASSUNTO

1 Descrive un caso di lipoma del colon associato con ginecomastia bilaterale

2 Lipoma del intestino grosso e secondo in frequenza solo ad adenoma e dovrebbe essere considerato nella diagnosi differenziale dei tumori abbracciando il colon

3 Discute l'aspetto etiologico patologico e sintomatologico

4 Lipoma si presenta piu frequentemente nel cieco e colon ascendente e puo simulare carcinoma Anemia secondaria d origine inesplicato dovrebbe dirigere l'attenzione alla porzione prossima del colon, sebbene il paziente qui riportato non ebbe l'anemia profondo generalmente associata col cambio maligno in questa regione

5 Pazienti con doglianza gastrointestinale vaghe, dovrebbero tollerare investigazione radiologica vigilante, siccome diversi lesioni nel lato destro del colon possono essere relativamente asintomatiche

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1 Es wird ein Fall von Lipom des aufsteigenden Dickdarms bei gleichzeitig bestehender doppelseitiger Gynaekomastie beschrieben

2 Lipome des Dickdarms folgen in Haeufigkeit unmittelbar dem Adenom und sollten bei der Differenzialdiagnose der Dickdarmgeschwuelste in Betracht gezogen werden

3 Aetiologische pathologische und symptomatologische Aspekte der Dickdarmlipome werden eroertert

4 Das Lipom tritt am haeufigsten im Zoekum und im aufsteigenden Dickdarm auf und kann aehnlich wie ein Karzinom aussehen Eine sekundaere Blutarmut unerklaerten Ursprungs sollte die Aufmerksamkeit auf den proximalen Abschnitt des Dickdarms lenken, wenn auch in dem hier beschriebenen Falle der Kranke keine schwere Blutarmut, wie sie im allgemeinen bei boesartigen Veraenderungen in dieser Gegend auftritt, aufzuweisen hatte

5. Kranke mit unklaren Magendarmbeschwerden sollten einer sorgfaeltigen Roentgenuntersuchung unterzogen werden, da viele Veraenderungen in der rechten Dickdarmhaelfte verhaeltnismaessig symptomlos verlaufen koennen.

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To Our Contributors Abroad

We regret to announce that under current publishing conditions it has become impossible for the *Journal* to arrange the translation into English of original articles submitted in other languages. With the single exception of articles written specifically for the *Seccion en Espanol*, which, of course, do not require translation, we must therefore request that all articles henceforward be submitted in the English language. Prompt publication can be greatly facilitated if all manuscripts are typed in double or triple space to allow room for editorial corrections. Your cooperation will be deeply appreciated.

Barium Modification with Methocel* in Diagnosis of Bowel Lesions

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A PRELIMINARY study[1] of the action of ingested barium sulfate proves that the primary cause of impactions is the affinity of the salt particles for each other This causes it to be immiscible with mucus or the fecal stream and leads to inspissation and the formation of concretions

In attempting to overcome this disconcerting and often dangerous feature of the radiopaque material, many agents have been added to it The results are variable, some mixtures interfere with digestion or irritate the mucus membrane to such a degree as to produce abnormal mucosal patterns, making the validity of the roentgen interpretations questionable

A safe barium salt has long been sought It is recognized that by deflocculation the basic salt can be prevented from losing its vehicle by absorption The substance found most useful in accomplishing this purpose is methyl cellulose, or methocel, one of a group of soluble cellulose compounds principally used in medicine as a bulk producing agent, and in industry as sizing material or as an adhesive for ceramics[2] When methocel is added to water, a stable colloid is formed that has excellent lubricating properties It is tasteless, does not interfere with digestion and has no effect upon the normal symbiosis of coliform organisms It mixes well with all intestinal secretions and is eliminated without disturbance as part of the fecal stream

When barium sulfate and 2 5 per cent methocel are well mixed and added to water, a permanent suspension is formed Microscopic examination of the mixture (Fig 1) shows a constant dispersion of the salt particles and Brownian movement, indicating the presence of an isoelectric suspension This solution is well tolerated by the digestive tract and passes without delay or need for purgation, even after retention for several days, which is frequent in the aged and in persons with bowel musculature of diminished propulsive force

Clinical evaluation of this combination proves additional values in its greater translucency and the sharper details of the mucosal patterns it reveals Viewing the hollow viscus with a thick mixture of barium and water gives limited information concerning the existing pathologic condition The deflocculated barium, because of its alteration to an even and finer dispersion, shows greater luminosity This is of particular use in differentiating gastric lesions which sometimes are missed or misinterpreted by roentgen examination (Figs 2 and 3) The lightening up effect, a fleeting interference with the flow of the solution, localizes intrinsic lesions in the bowel (Fig 3) The importance of this is well understood in searching for pathologic changes hidden by loops of bowel, e g , in the sigmoid and splenic flexure areas of the colon The cobra sign, demonstrating the size and location of polyps, can be seen with greater ease

The double air contrast technic of major intestinal study with the suspended barium is also enhanced Five hundred Gm of the methocel barium mixture added to 2 quarts of water is a suitable quantity for enema studies When a thinner mixture is required, 2 tablespoonfuls of the dry mixture may be added to the usual quantity of barium sulfate will be effective These solutions, when visualized fluoroscopically, are seen to flow more slowly through the lumen of the bowel This is believed to be due to the adhesiveness of the colloid and is of value, since it prevents too rapid coating of smaller pathologic variants It is also noted that a third dimensional effect is readily obtained Normal as well as abnormal variations

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From the Section on Proctology Department of Surgery Menorah Hospital

Read at the Fifteenth Annual Assembly of the United States Chapter International College of Surgeons Cleveland Nov 2 1950

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*Brand name for methylcellulose Manufactured by Dow Chemical Company

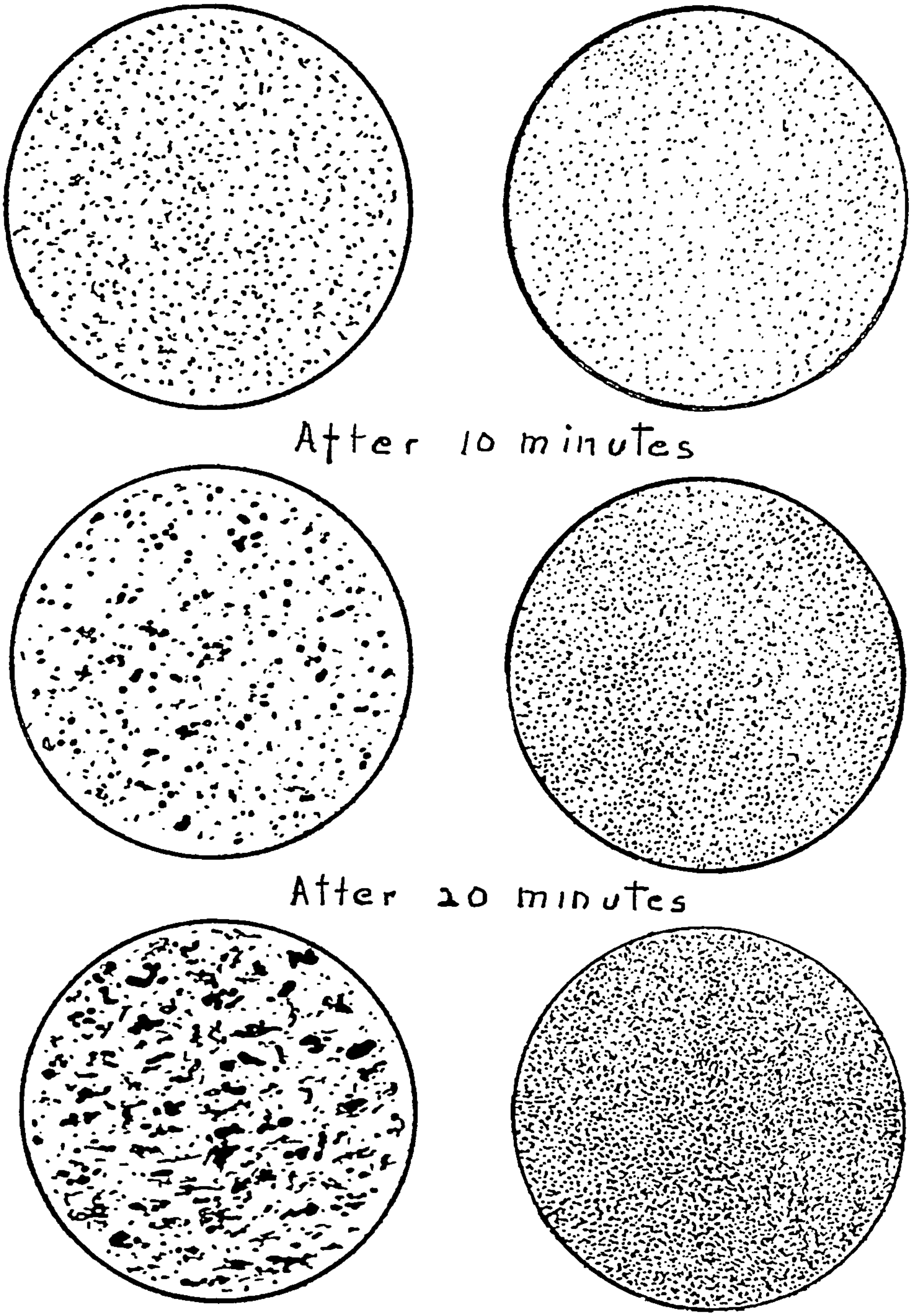

Fig. 1.—Microscopic illustration of the effect of evaporation on barium-water *(left)* and barium-methocel-water (*right*).

are sharply defined. Diverticula are well coated and empty, without retention. Malignant invasion of the bowel wall can more easily be demonstrated (Figs. 5 and 6).

Cachexia, avitaminatosis and other physiologic changes become evident in the altered

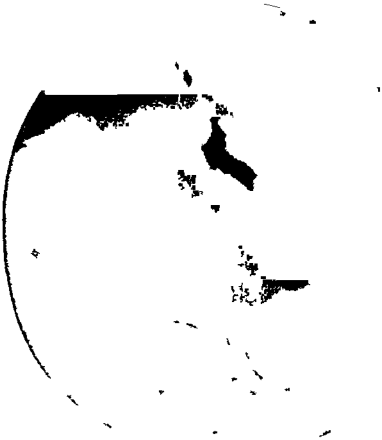

Fig 2—Defect in region of cardia observed through a distensible fundus, which proved to be carcinoma of cardia

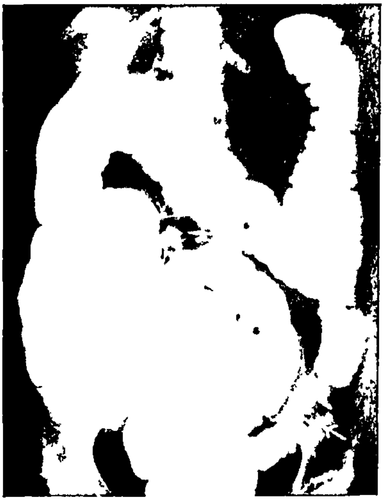

Fig 4—Lightening up effect illustrating location and size of a pedunculated polyp

Fig 3—Penetrating ulcer of lesser curvature of stomach, with displacement of rugal markings at base This proved to be a benign ulcer with marked edema

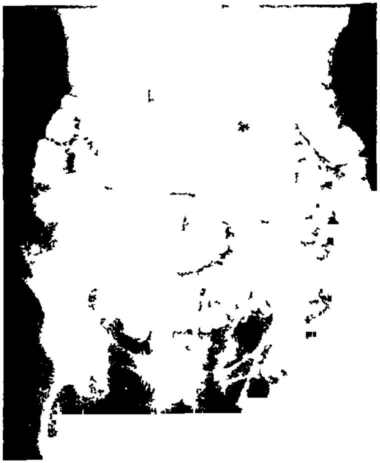

Fig 5—Diverticulosis with defect at splenic portion of transverse colon, with evidence of invasion of wall

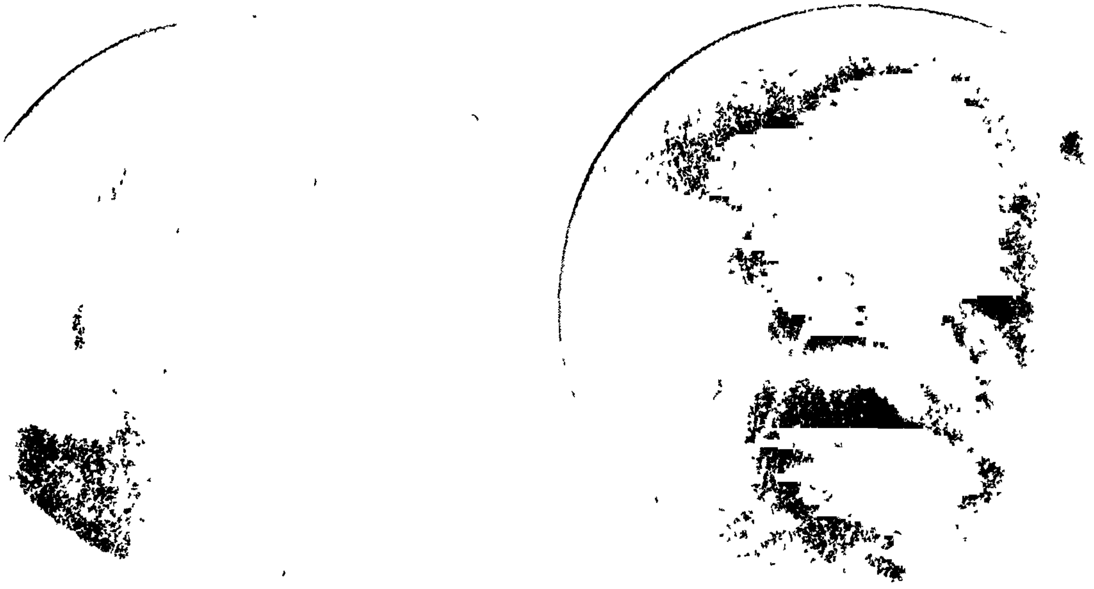

Fig. 6.—Spot films in same case, showing scalloped edges and apple core signs of constricting carcinoma.

shadows and can readily be seen. Ulcerative colitis, regional ileitis and polyposis can be identified with greater accuracy because of the improved clarity of the fluoroscopic and plate images. Diseased bowel may easily be differentiated from the uninvolved parts and progress followed with greater assurance.

SUMMARY

Methocel added to barium sulfate, when in solution, becomes a permanent suspension that does not inspissate or form impactions.

Greater mucosal detail is demonstrated by its use, and a third-dimensional effect is obtained when air contrast studies are done.

RIASSUNTO

"Methicol" aggiunto al solfato di bario quando messo in soluzione diviene una sospensione permanente che né viene spessata né forma delgi imballaggi. Coll' impiego si dimostra piu vivo la particolaritá dell mucosa ed un effetto, terzo dimenzionale, risulterá nel compimento di studio in aria contrasto.

ZUSAMMENFASSUNG

Die Mischung von Methocel mit Bariumsulfat und Wasser ergibt eine dauerhafte Suspension, die weder zu Eindickung noch zu Verklumpung fuehrt. Ihre Anwendung verbessert das Detail der Schleimhautdarstellung und ruft, wenn bei der Untersuchung Luft als Kontrastmittel hinzugefuegt wird, einen stereoskopischen Effekt hervor.

RÉSUMÉ

L'addition de methocele au sulfate de barium mis en solution donne uns suspension qui ne se dépose pas et qui ne se solidifie pas. Les détails de la muqueuse sont mieux démontrés par son emploi et on obtient ainsi une troisieme dimension après distension effectuée pour l'étude des contrastes aérés.

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Acute Pancreatitis

J G PROBSTEIN, M D, F A C S, F I C S
ST LOUIS

KNOWLEDGE of acute pancreatitis is comparatively recent. The first clear cut correlation of the gross pathologic and clinical aspects of acute hemorrhagic pancreatitis was made by Reginald Fitz in 1889. Thereafter, in sporadic cases acute hemorrhagic pancreatitis was recognized preoperatively or *ante mortem, but more often the disease was* first diagnosed at the operating table or the autopsy table, whereupon the surgeon was likely to exhibit almost as much shock as his patient.

Acute hemorrhagic pancreatitis however was and still is a rare disease. Shortly after World War I there were occasional reports of a milder form of pancreatitis or pancreatic edema. Yet fifteen years ago Elman was able to find only 34 cases of acute transient pancreatitis reported in the world medical and surgical literature. Today it is known that this condition, which is variously termed acute transient pancreatitis, acute interstitial pancreatitis or acute pancreatitic edema, is an extremely common disease. In the hospital in which I practice, records show that, over a thirteen year period (between 1934 and 1947), 1 of every 600 patients admitted to the surgical and medical services was found to have acute pancreatitis (proved by serum amylase determinations), and the true incidence is undoubtedly greater, since some of the cases were not recorded in the early years of the hospital history. This increasing incidence of the diagnosis of acute pancreatitis is due to the work of pioneers in the field first, Elman, who discovered that the level of blood amylase is elevated in the presence of pancreatitis, second, Michael Somogyi, who developed a rapid, delicate technic of determining the blood diastase level, and third those adherents of Elman who carried on the campaign he began.

Unawareness of the frequency of acute pancreatitis and experience with a fairly large number of cases during the past fifteen years have led to the formulation of certain answers to the clinical problems presented in these cases.

Obviously the clinician's first problem in *dealing with acute pancreatitis is making the* diagnosis. Only rarely can acute hemorrhagic pancreatitis be diagnosed on the basis of the triad of profound shock peritoneal irritation and signs of ecchymosis about the umbilicus or the left costovertebral angle. As a matter of fact I have not seen a combination of this sort in the past twenty years. In my experience the only way to diagnose pancreatitis with certainty is to confirm the existence of an elevated blood diastase level. Pain in the upper part of the abdomen (radiating either to the right or the left), nausea vomiting epigastric tenderness slight fever, leukocytosis and mild jaundice are features of most cases. Yet, when the physician has completed the physical examination and noted the history of the patient rarely if ever, is he able to state unequivocally that the patient has acute pancreatitis rather than a coronary occlusion, a perforated ulcer, acute cholecystitis or intestinal obstruction. In my experience there is no typical clinical picture. At best the physician can only suspect acute pancreatitis. It is up to the laboratory to confirm the diagnosis by finding an elevated blood or urine diastase level.

In a series reported by myself almost ten years ago about 75 per cent of the patients had diastase levels of over 500, and it is my impression now that if we should analyze these cases since that time, the percentage would be even higher. It has been our practice to order a blood diastase determination whenever the patient complains of severe pain in the upper part of the abdomen. During the past year I have encountered 2 cases of acute pancreatitis with elevated diastase levels occurring in the first few postoperative days when pain was no more than might be complained of by any postop[illegible] patient, but [illegible]h the pati

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From the Department of Surgery Jewish Hospital and the Washington University School of Medicine Aided by the Davis May—Florence G May Fund

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going suddenly and inexplicably into shock. It is my feeling now that a blood diastase determination should be carried out in the case of any patient who goes into seemingly unexplainable shock after a laparotomy, particularly if the operation was in the upper part of the abdomen.

When renal function is normal, the presence of an elevated blood diastase level plus acute pain in the upper part of the abdomen is pathognomonic of acute pancreatitis, with one qualification; there may exist a posterior perforation of the duodenum or the stomach. About ten years ago I reported a case in which the blood diastase content rose to 600 units. A diagnosis of pancreatitis was made and the patient treated conservatively. Unfortunately the patient died, and the autopsy revealed peritonitis from a posterior perforated ulcer. Of 9 cases of perforated ulcer, the blood diastase level in 3 cases was slightly elevated; only in the fourth (previously mentioned) was it moderately elevated. This is to be contrasted with the foregoing observation that in about 75 per cent of cases of pancreatitis there is a diastase level of over 500 units.

Fortunately about 90 per cent of freely perforating ulcers are anterior, so that difficulty in differentiating pancreatitis from a perforated ulcer should seldom arise.

In diastase determinations for several thousand patients, 1 patient has been encountered who characteristically had a blood diastase value over ten times the normal. Clearance studies revealed specific inability to excrete diastase normally into the urine.

Unfortunately, elevation of the blood diastase value is subject to one serious limitation. The elevation is only transient. In general, it lasts three to four days after the onset of abdominal pain, but it may be of much shorter duration, sometimes as short as thirty-six hours.

Recently, Knight and Meuther of St. Louis University proposed a prostigmine test for pancreatitis. It was their contention that patients who have acute pancreatitis show characteristic alterations of the blood diastase after the intramuscular injection of 1 mg. of prostigmine. This test is now under investigation by Dr. Leo A. Sachar and Dr. Whittico in our laboratories. Studies have been made of the value for blood diastase in normal persons before and after receiving prostigmine. The changes are unpredictable and inconstant. The results of the prostigmine test on 8 patients known to have had acute pancreatitis were observed. The deviations of the blood diastase after the introduction of prostigmine was not characteristic; at any rate, it was well within the limits existing in normal persons. The prostigmine test in my hands has been completely without value thus far.

Elevation of the rate of excretion of diastase in the urine persists for some hours after the elevated blood diastase level has returned to normal. The details of this relation are now being worked out by Dr. Carl Heifetz. Perhaps in the future there will be an occasional return to the older procedure of determining the urine diastase level in order to establish the diagnosis of acute pancreatitis.

Having made the diagnosis, the physician is faced with the problem of treatment. In general, the various methods of therapy fall into two categories: operative and nonoperative. Those who advocate surgical intervention differ as to whether the pancreas can or should be drained, or whether a cholecystectomy should be performed to decompress the common bile duct. Still others recommend operative therapy only in cases of hemorrhagic pancreatitis. On the basis of experience at the St. Louis Jewish Hospital, where over 100 patients with pancreatitis were treated in the past twelve years, I feel that surgical intervention has no place in the early treatment of acute pancreatitis. In my opinion this holds true whether the condition present is hemorrhagic pancreatitis, interstitial pancreatitis or pancreatitic edema. Indeed, in my experience it has been impossible to tell clinically whether one is dealing with mild hemorrhagic or a severe interstitial pancreatitis.

The treatment of the acute attack is primarily symptomatic and supportive. Pain is relieved by an adequate dose of morphine. No relief is usually afforded by intravenous aminophyllin or by nitroglycerin held under the tongue, although they are usually tried. A large, hot, wet pack held to the abdomen often adds to the patient's comfort. When the discomfort is severe continuous gastric suction is applied

Supportive therapy consists of maintaining the patient's nutrition at least to the point of preventing ketosis and, in the presence of shock of maintaining the blood volume The latter is accomplished by giving plasma or blood to offset the loss of plasma into the peritoneal cavity All patients should receive at least 200 Gm of carbohydrate daily to prevent ketosis

Under such a regime the vast majority of patients will become afebrile and asymptomatic in less than a week One hundred patients with acute pancreatitis seen at the Jewish hospital between 1934 and 1949 were managed conservatively, and only 2 died of this disease Rarely, and presumably only when the pancreatitis is severe is there persistent fever and sometimes the appearance of a palpable mass in the epigastrium is noted This indicates the development of a pancreatic abscess Surgical drainage of such masses with removal of necrotic pieces of pancreas, is then indicated Surgical intervention therefore, is reserved for the complications of acute pancreatitis rather than employed in the treatment of pancreatitis itself

Several weeks after a patient has recovered, a gallbladder roentgen series should be obtained if it is not already known that the patient has cholecystic disease As is well known, about two thirds of all patients with acute pancreatitis have chronic cholelithiasis because, for unknown reasons, the gallbladder fails to concentrate the dye regardless of whether the organ is anatomically normal or not during the first two weeks

If the roentgenogram discloses gallstones, it is my conviction that a cholecystectomy should be performed and the common duct explored as an elective procedure or interval operation Yet one should realize that these procedures in themselves will not prevent recurrence of pancreatitis In a series of 65 pancreatitic patients recently studied by me 11 had undergone previous cholecystectomies I believe that the common duct should be explored for two reasons First, of 6 cases in which this procedure was carried out, stones were found in 2, second if and when an attack of pancreatitis occurs after cholecystectomy, the question always arises whether a stone was overlooked in the common duct It is some comfort to the surgeon to know that at least he has looked into the common duct Moreover the existence of stones at an earlier exploration of the common duct strongly influences the odds of a stone s presence in the common duct later That is the chance of a stone's being overlooked is much greater when some stones are found in the common duct than when no stones at all are found

This brings one to perhaps the most difficult surgical decision to be made in the handling of acute pancreatitis Should a patient who has repeated attacks of pancreatitis after cholecystectomy be subjected to exploration or reexploration of the common duct? I know of several instances in which such a procedure was carried out, and the common duct was found to be empty Hence, I feel that pancreatitis *per se* is not an indication for reexploration

What is the eventual outlook for patients who have had acute pancreatitis? The immediate prognosis as I have seen it is excellent I cannot be so definite as to what may be expected in the future in these cases because as yet I have not accumulated a large enough or a long enough experience When one recalls that the disease has been recognized only in the past fifteen years it is apparent that knowledge of the natural history of the condition will be somewhat sketchy

However, it appears from an analysis of my cases that about 50 per cent of the patients will have a recurrence of severe abdominal pain, presumably due to pancreatitis Of 65 patients observed at the Jewish Hospital in a ten year period 14 had recurrences of pancreatitis requiring rehospitalization Three of the 41 had a third severe attack The interval between attacks ranged from a few weeks to three and one half years Between these severe attacks the patients may have frequent mild pain in the upper part of the abdomen the pathogenesis of which is unknown The attacks are so mild that the patient does not require hospitalization and no diastase reading is obtained On a few occasions a blood diastase level has been deter mined during an attack and found to be normal.

Recently (1946) investigators at the Mayo Clinic have centered the attention of those interested in pancreatitis on chronic pancreatitis or, as they call it, "chronic relapsing pancreatitis." For the past half decade "chronic pancreatitis" has been a sort of will-of-the-wisp disease in the clinical literature. Now, however, more consideration must be given to this condition. The Mayo group has suggested that the condition results from repeated attacks of acute interstitial pancreatitis, which, as is now known, is common.

I have not known of the development of chronic pancreatitis; that is, I have not known of a combination of diabetes, steatorrhea, pancreatic calculi and occasionally obstructive jaundice in any of my cases. As yet I am not sure whether this means that clinical chronic pancreatitis is practically never a sequela of acute interstitial pancreatitis or whether it is only an infrequent one.

At present, however, my opinion is that the chronic relapsing pancreatitis characterized by calcification, diabetes, steatorrhea and sometimes obstructive jaundice *probably* has a different pathogenesis. Patients with chronic pancreatitis have a history of daily abdominal pain for months or years before signs of pancreatic insufficiency appear. Patients with interstitial pancreatitis tend to have multiple attacks, but they are free of pain for months or even years. I am impressed by the fact that so many patients with chronic pancreatitis have a history of alcoholism, whereas this is not nearly so often true of patients with acute interstitial pancreatitis. Finally, chronic pancreatitis in my experience is rare, while acute interstitial pancreatitis is very common. Certainly, if chronic pancreatitis is a sequel of repeated acute interstitial pancreatitis, it should be encountered more frequently than it is. However, a final verdict on the eventual fate of patients with acute interstitial pancreatitis must be deferred. If it becomes apparent later that many of them do progress to the stage of chronic pancreatitis, I should be much inclined to divide the sphincter of Oddi as advocated by Doubilet. If, on the other hand, the disease proves to be self-limited, as I now think it is, I shall persist in the treatment I have outlined. To date I have encountered only 1 patient who had had such frequent abdominal pains between her verified attacks of acute pancreatitis that in retrospect a sphincter-cutting operation appears to have been indicated. However, even in her case the pains disappeared after a prolonged period of drainage of the common bile duct through a "T" tube; now, at the time of writing, approximately ten years after her initial attack of pancreatitis, there is still no indication of chronic pancreatitis.

SUMMARY

The author concludes that acute inflammations of the pancreas are far more frequent than is generally supposed. Patients with this disease present no typical clinical picture; hence, the most important diagnostic measure is the determination of the blood diastase level. The vast majority of the patients recover with nonoperative therapy. Surgical intervention should be reserved for the complications of pancreatitis. Acute edematous pancreatitis tends to recur, but in the author's experience it rarely, if ever, progresses to the chronic pancreatitis characterized by calculi, steatorrhea, diabetes and obstructive jaundice.

RÉSUMÉ

Les inflamations aigües du pancréas sont plus fréquentes qu'on le croit. Les malades avec cette maladie, ne pensent pas de se soigner et il en résulte que les méthodes de diagnostic les plus importantes sont la détermination de la diastase du sang.

La majorité des malades se rétablissent avec cette thérapie non opératoire. L'opération sera réserveé pour les complications pancréatiques. Les pancreatites aigües et oédémateuses ont une tendence à recidiver; mais dans notre expérience, il est rare qu'elles, determinent une pancreatite chronique caractérisée par des calculs, par la stéatorrhé, par le diabète, ou par jaunisse obstructive.

RESUMEN

Hemos observado que las inflamaciones agudas del páncreas son mucho más frecuentes de lo que creíamos. Los pacientes que sufren

esta enfermedad no presentan un cuadro clínico típico, de aquí que la medida mas importante para el diagnóstico es la determinación de la diastasa sanguínea La mayoría de los pacientes se restablecen con una terapia no operatoria La operación debe reservarse para las complicaciones de la pancreatitis La pancreatitis edematosa tiende a recurrir, pero según nuestra experiencia raramente, si alguna vez, progresa a pancreatitis crónica, caracterizada por calculos, esteatorrea, diabetes e ictericia obstructiva

ZUSAMMENFASSUNG

Wir haben gefunden dass akute Entzuendungen der Bauchspeicheldruese weit haeufiger sind als wir je gedacht haetten Solche Kranke bieten keine typischen klinischen Krankheitsbilder und daher ist die Bestimmung der Blutdiastase das wichtigste diagnostische Mittel Die ueberwiegende Mehrheit der Kranken erholt sich unter nichtchirurgischer Behandlung Die Operation sollte fuer die Komplikationen der Bauchspeicheldruesenentzuendung reserviert bleiben Die akute oedematoese Bauchspeicheldruesenentzuendung neigt zu Rueckfaellen, entwickelt sich aber nach unserer Erfahrung nur selten, wenn ueberhaupt, zu einer chronischen Bauchspeicheldruesenentzuendung, die durch Steine, Steatorrhoe, Diabetes und Obstruktionsikterus charakterisiert ist

RIASSUNTO

Le infiammazioni acute del pancreas sono molto piu' comuni di quanto si ritiene generalmente Il quadro clinico non e' tipico la determinazione della diastasi nel sangue e' ancora il metodo di laboratorio piu' utile La maggioranza dei pazienti guarisce senza operazione Questa va riservata ai casi nei quali insorgono delle complicazioni La pancreatite acuta edematosa tende a recidivare, ma non si trasforma quasi mai in una pancreatite *cronica caratterizzata da calcoli, steatorrea* diabete ed itterizia

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THE ITALIAN CHAPTER OF THE INTERNATIONAL COLLEGE OF SURGEONS WILL HOLD ITS ANNUAL ASSEMBLY IN FLORENCE, ITALY

MAY 4 and 5, 1951

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Impending Death Under Anesthesia

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IN all surgery there is probably no more dramatic catastrophe than impending death under anesthesia. Sudden stoppage of the heart during an operation is always terrifying. Until recently it was believed that unless circulation could be almost instantly restored, and with it the supply of blood to the brain, irreversible damage to the higher cerebral centers was inevitable, and that, even supposing the patient does survive, the inescapable end result is blindness, paralysis or dementia.

The chief purpose of this presentation is to demonstrate that these consequences are not inevitable; that they do not necessarily follow cardiac arrest of much longer duration than the three or four minutes formerly considered the maximum for survival, and that even serious changes may prove reversible. A case will be reported in which the patient, a young woman, made a full recovery after cardiac arrest of *nineteen minutes' duration,* followed by appendectomy, and about a year later gave birth to a normal child.

This case adds to the mounting evidence that cardiac and respiratory arrest under anesthesia is amenable to control under proper conditions and with adequate technical skill. Its mastery demands split-second decision and instant courageous action by the surgeon and anesthetist.

A busy surgical clinic may expect an average of 1 or 2 of these tragic cases per year.

History.—The first death attributed to anesthesia occurred on Jan. 28, 1848. The earliest reports of manual massage for cardiac resuscitation were the experimental studies of Schiff in 1874. The first attempt at cardiac massage in man, made by Niehaus in 1889, was unsuccessful. Maaj in 1900 reported the first partial success; he established cardiac pulsation and spontaneous breathing for eleven hours. Ingelsbrid in 1901 was the first to succeed in resuscitating the heart, though his experience was not reported until 1904. In 1902 Starling and Lane reported the first case of successful resuscitation of the human heart by subdiaphragmatic massage.

Etiologic Factors.—Cardiac and respiratory arrest may be (*1*) reflex, due to vagovagal stimulation; (*2*) traumatic, due to injury of the heart or pericardium during operation; (*3*) the result of functional abnormality, e.g., ventricular fibrillation due to an oversupply of epinephrine, whether injected or secreted, or (*4*) induced by faulty selection or administration of anesthetic agents.

Pathologic Picture.—Three vascular syndromes are associated with this emergency: *vasoporosis, vasoparalysis* and *vasothrombosis* (Scheinker). These may be considered phases of the same process, depending on its duration and severity.

The functional impairments resulting from abrupt interruption of the blood supply to the cerebrum are due primarily to anoxia, which induces hypoglycemia and an increase in extracellular potassium. Stasis of circulation causes local accumulations of carbon dioxide and other metabolites. Carbon dioxide, an active vasodilator, causes increased permeability of the vessel wall, especially at the point of transition from capillary to venule, where oxygen tension is at its lowest and the endothelium most vulnerable. Accumulation of fluid and blood cells in dilated perivascular spaces further retards the circulation, thus setting up a vicious circle that increases hypoxia and damage to nerve tissues.

After restoration of the vital centers there occurs a period of hyperactivity. Coma may last for twenty-four hours after an arrest of only four minutes. The period of transition that follows lasts for several days, with gradual return of cerebral functions. Cerebellar ataxia is the most persistent neural dysfunction prior to recovery.

Symptoms.—The principal signs and symptoms of cardiac arrest are (*1*) stoppage of breathing; (*2*) disappearance of pulse beat, blood pressure and cardiac sounds; (*3*) ab-

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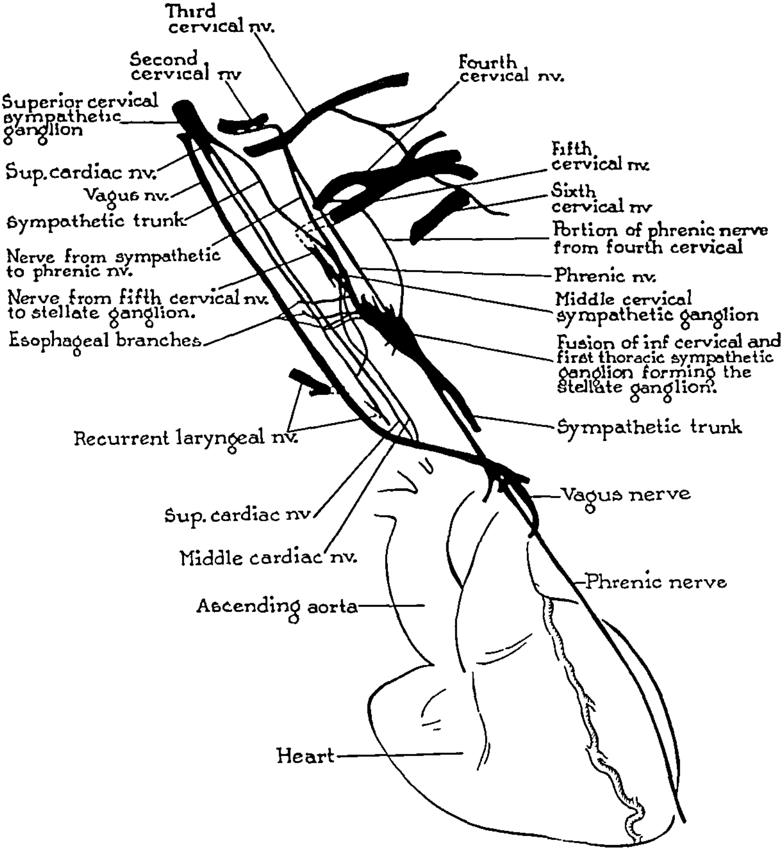
Third cervical nv.
Second cervical nv
Superior cervical sympathetic ganglion
Sup. cardiac nv.
Vagus nv.
Sympathetic trunk
Nerve from sympathetic to phrenic nv.
Nerve from fifth cervical nv. to stellate ganglion.
Esophageal branches
Recurrent laryngeal nv.
Sup. cardiac nv
Middle cardiac nv.
Ascending aorta
Heart
Fourth cervical nv.
Fifth cervical nv.
Sixth cervical nv
Portion of phrenic nerve from fourth cervical
Phrenic nv.
Middle cervical sympathetic ganglion
Fusion of inf cervical and first thoracic sympathetic ganglion forming the stellate ganglion.
Sympathetic trunk
Vagus nerve
Phrenic nerve

Diagram of nerve paths to pericardium and heart From Coffey (see bibliography)

sence of bleeding in the surgical wound and (4) pallor or cyanosis If anoxia is far enough advanced the pupils may be dilated The first symptom noted is usually cessation of breathing

Diagnosis —The first step is to answer the all important question *Has the heart actually ceased to beat?* Immediately on stoppage of breathing the anesthetist should feel the pulse to test the circulation If the surgeon has access to one of the larger arteries, he should test it by palpation If the abdominal or the thoracic cavity has been opened he should palpate the heart from below or from above, as the case may be.

If neither of the great cavities is open, the heroic measure of opening the chest is justified. Sudden cessation of pulse and blood pressure make it immediately mandatory. If the heart has actually stopped beating or is fibrillating, the surgeon will then be ready to begin cardiac massage instantly; if the pulse is only extremely weak, little harm has been done.

Prophylaxis.—To prevent overstimulation of the vagus nerves, atropinization or blocking of afferent stimuli with a local infiltration anesthetic has been recommended. For arrhythmia caused by trauma near the pulmonary hilus, 10 cc. of 1 per cent procaine hydrochloride solution may be given intravenously. There is some doubt as to the advisability of applying procaine direct to the heart.

It is important to remember that a patient who stops breathing *is not necessarily suffering from cardiac arrest.* The condition may be the so-called *"blue asphyxia."* Here the trouble is chiefly respiratory, and treatment consists of clearing the airway, pulling the tongue forward, administering oxygen, and removing with the finger any impaction of the epiglottis, together with some form of artificial respiration. On the other hand, *"white asphyxia"* is far graver, having an actual cardiac origin. Here *cardiac massage must be resorted to at once.*

If a diagnosis of cardiac arrest has been made without visualization of the heart itself, the heart may be goaded into action by pricking the auricle with a needle thrust into the third right costal interspace at the upper rim of the fourth rib, close to the sternal border, the needle being directed upward. If this fails, institute cardiac massage at once.

The absolute necessity of immediate decision is obvious. *Delay in diagnosis is the chief cause of failure.* For this reason an alert and well trained anesthetist is indispensable. The anesthetist must notice asystole the instant it occurs, and both he and the surgeon must be ready for instant and decisive action. It goes without saying that a complete outfit of the necessary equipment should always be at hand and in perfect condition for use.

Management: Technic of Massage.—Once actual arrest has been demonstrated, prompt and drastic action must be taken. In such an emergency a calm attitude, clean hands and a keen knife are the important paraphernalia. Act without delay. Asystole calls for cardiac massage to produce an adequate flow of blood and artificial ventilation of the lungs to assure adequate oxygenation.

The heart may be reached by three routes: (*1*) transperitoneal subdiaphragmatic; (*2*) transperitoneal transdiaphragmatic, and (*3*) transthoracic. If the third route is used, make the incision in the left fourth interspace from the edge of the sternum to the posterior axillary line. There is no bleeding. Carry the incision rapidly through the chest wall and the pleura. Introduce the hand between the fourth and fifth ribs and get to the heart. In the presence of asystole this organ is flabby and motionless. If there is ventricular fibrillation it will feel like a "bag of worms."

I prefer the standard method of cardiac massage, which is as follows: make an abdominal opening in the midline from the xiphisternum, large enough to admit the right hand. With the heel of the left hand pressing downward from the outside, the balls of the fingers of the right hand can exert effective pressure on the ventricles through the diaphragm. For about thirty seconds these intermittent movements should be quick and strong. A single contraction of the heart should never be mistaken for victory; all too often it is not repeated unless the surgeon continues his efforts without pausing. Where success is not prompt, enter the pericardial sac through the diaphragm.

Surgeons differ as to the rate at which the heart should be compressed. The majority recommend 20 to 60 compressions per minute.

There are some variations of approach. For example, Nicholson makes a buttonhole incision in the diaphragm, behind the xiphisternum. The surgeon's thumb is passed through the opening, and massage is accomplished by compressing the ventricles as one would squeeze the bulb of an atomizer. Lampson's approach is intercostal, with an incision in the fifth space for direct access to the pleural cavity. The first two fingers of the surgeon's left hand are inserted, and massage is performed by compressing the ventricles against the sternum at the rate of about one compression per second

Beck uses electrical stimulation in cases of ventricular fibrillation Two padded silver electrodes (2 cm square) are applied to the anterior and posterior surfaces of the heart An alternating current is applied for 0 1 to 0 5 second The heart muscle is contracted and brought to a standstill then normal rhythm is renewed Should the first shock fail, manual massage is resumed procaine injected and the shock repeated If failure still results, 1 cc of epinephrine 1 1 000 or 5 cc of calcium chloride 1 per cent is injected into the right ventricle to increase tone and elasticity, after which the shock is again repeated According to Beck, fibrillation is usually overcome This method is experimentally interesting but clinically impractical in most cases

Simultaneously with the beginning of massage, Lahey uses 2 cc of 2 per cent procaine solution injected into the right ventricle and an equal amount into the pericardial cavity, or 5 cc of epinephrine 1 1 000 and 9 5 cc of 1 per cent procaine both drugs being administered in a single injection In the presence of actual cardiac arrest inject 10 cc of this mixture by the quickest and most easily accessible intravenous route (antecubital vein) If the patient is aged or debilitated, administer only 5 cc If the heart has not resumed action soon after cardiac massage is begun, inject 5 cc of the mixture directly into the right auricle or ventricle

Artificial respiration with pure oxygen is carried on simultaneously with the massage but is discontinued while the incision is being made The intratracheal tube method is effective

The importance of prompt massage cannot be overestimated The first five or six minutes are critical (Weinberger), after that interval, irreparable cortical and medullary changes are said to occur Delay of more than five minutes in starting massage is hazardous

Second in importance to cardiac massage is artificial respiration, which implies "rhythmic insufflation of the lungs preferably through an endotracheal tube, at the rate of 24 per minute and at a pressure not exceeding 15 mm of mercury " Artificial respiration has a twofold function to oxygenate the blood in the pulmonary vessels and to aid in maintaining the general circulation

Complications—Spinal anesthesia though extremely valuable for the excellent relaxation it affords, always involves some risk of cardiac arrest Varying mortality rates have been recorded, from 1 in 100 (Sise) to 1 in 10 000 (Babcock) The true incidence probably falls between these two extremes Death occurs most frequently in aged persons poor operative risks and Negroes For the young healthy patient spinal anesthesia apparently is no more dangerous than any other type

"Ether Convulsions"—This condition may be due to (*1*) overheating (*2*) overoxygenation and cerebral congestion, or (*3*) the action of certain streptococci (Mayo) Treatment consists of (*a*) carbon dioxide and oxygen inhalations continued even after the convulsions have ceased, (*b*) prompt intravenous injection of sodium pentothal 3 to 5 cc , (*c*) injection of lobeline (Bailey), and (*d*) lifting of the patient to a sitting position before pentothal is given (A Smith)

Collapse of the Patient under Intravenous Anesthesia—This requires an antidote Order an intravenous injection of picrotoxin 1/1,000 (1 mg acts as an antidote for 30 to 40 mg of pentothal Collapse under *spinal anesthesia* requires the steep Trendelenburg position and administration of a substance that raises the blood pressure (methedrine)

Aspiration of Vomited Material—This is serious if not attended to at once Employ the force of gravity by tilting the whole table, aspirate fluid laryngoscopically from the pharynx, and, when urgently indicated, by means of a laryngotomy or a tracheotomy

Prognosis—The *cause* of asystole has much to do with the prognosis For a normal heart which has received an overdose of anesthetic the outlook is good For sudden arrest in a normal heart due to reflex phenomena (vagovagal reflex) the prognosis is favorable if the duration of arrest is not over three minutes Arrest due to asystole or ventricular fibrillation caused by anoxia is a graver matter, since the brain may have suffered damage before the heart stopped beating

REPORT OF CASE

A married woman aged 23 was admitted to the American Hospital for chronic appendicitis. There was no evidence of other organic disease.

On June 25, 1948 (premedication 1½ gr. nembutal and ⅛ gr. scopalamine) operation was performed. Spinal anesthesia was employed, 14 mg. of pontocaine with 1 cc. of 10 per cent dextrose solution being injected into the subarachnoid space at the level of the third and fourth lumbar segments. The blood pressure prior to its administration was 120 systolic and 80 diastolic.

The anesthesia reached the level of the eighth thoracic segment. On the table the patient was apprehensive, restless and uncooperative. Pentothal sodium in 6 per cent solution was started in the ankle vein not less than ten minutes later, a total of 0.35 gr. being administered by continuous drip for three to five minutes. The blood pressure decreased to 100 systolic and 60 diastolic; one minute later these values dropped to 60 and 0 respectively. The patient's breathing was shallow, but with apparent fair exchange. Her face was livid. No carotid pulse could be felt. Administration of pure oxygen by mask was started at once; the drapes were removed and a check was made for the aortic pulse, without result. At this point I was called. I immediately made a left superior rectus incision, opened the diaphragm and began cardiac massage. At the same time I ordered an intracardiac injection of epinephrine 1:10,000, in the amount of 5 cc., meanwhile continuing to massage the heart. Between five and six minutes later, cardiac action was observed. During this time the patient, who had altogether ceased to breathe, was intubated, and artificial respiration with pure oxygen was begun. Five per cent dextrose in water was started in a vein of the foot and set to run as rapidly as possible. When the heart action was firmly reestablished, appendectomy was carried out through the upper left rectus incision made to reach the heart.

The total time of cardiac arrest was nineteen minutes.

The patient remained in deep coma for four days. There was no response to noxious stimuli. The pupils were dilated and fixed. A classic Magnus-de Kline phenomenon was present, as was a continuous bilateral Babinski sign. On the day of the operation one gained the impression of cortical degeneration secondary to cerebral anoxia. Bilateral block of the stellate ganglion was performed and repeated on each of the two following days. Spinal puncture on the first postoperative day yielded clear normal fluid under a pressure of 280. The coma had apparently deepened. The pupils were smaller and the Magnus-de Kline phenomenon present.

On June 28 the patient seemed less oblivious, though still in coma. There was no response to stimuli, but the eyes were open and the pupils wide, round, equal and reacting to light. The fundi were normal. There was no sucking reflex. No stiffness of the neck was observed. The limbs were extended. Occasionally the legs stiffened, the feet assuming a tonic equinovarus position. Deep reflexes were present in all four extremities. No pathologic arm reflexes were noted. The Babinski sign was easily elicited bilaterally, though it was more marked on the right.

On June 29 the patient's condition grew worse. She was weak and pale, her lips cyanotic and her respirations shallow. She vomited repeatedly. On June 30 her sensorium was slightly clearer. She responded to her name by opening her eyes and trying to fix them on the examiner. Hypertonicity of the limbs had disappeared. There was no increase in the deep reflexes, but the Babinski sign was still marked on both sides. On July 2 there was a definite if slight improvement. The patient was less lethargic and understood simple orders; she could follow an object with her eyes in any direction, and there was no nystagmus. She could move her arms and legs feebly; the left arm wavered. She was still unable to utter vocal sounds. All the deep reflexes were markedly decreased, but the bilateral Babinski sign was present.

On July 3 and 4 her improvement continued. She regained full consciousness, appeared to understand what was said to her, and was able to smile. Motor weakness in the extremities was still marked. The reflexes were unchanged.

By July 9, motor power in the legs showed considerable improvement. The arms were still weak. The finger-nose test revealed disturbance in coordination on the left side. The patient still could not talk but repeated some vowel sounds and one-syllable words in a low, tired voice. By July 12 she uttered complete sentences, though her speech was slurred, scanning and indistinct. July 13 found her able to walk with assistance, though she staggered and kept her gaze on the floor. Babinski and Gonda signs were marked on the left side, less pronounced on the right.

From this time on the patient's progress was steady. Her gait, motor power and articulation improved. Amnesia was present, dating from her admission to the hospital. She could write only single letters but solved simple arithmetic problems with no difficulty. The Babinski sign disappeared from the right side. By July 27 she was able to walk alone. Her strength had increased. The objective neurologic signs were about the same, but the deep reflexes were more nearly normal and the Babinski sign on the left was now equivocal On discharge from the hospital her mental processes were still foggy and her speech hesitant, but improvement continued By November the finer movements of the extremities were entirely restored and her speech was practically normal She was then two and a half months pregnant Her gestation was normal, as was her delivery after three hours of labor No anesthetic was used The child was a healthy boy weighing 7 pounds 7 ounces (3 4 Kg) *

GENERAL COMMENT

Numerous recent contributions, including both clinical and experimental experience have been made to the literature on this subject (see bibliography) The duration of arrest after which the patient may recover remains an open question Touroff and Adelman in 1949 reported a case in which the patient recovered fully after an arrest lasting forty minutes They expressed their opinion that cardiac massage is the prime factor in maintaining life until spontaneous cardiac action is restored They referred to the work of Dripps and his co workers who stated that skilful cardiac massage can produce a systolic blood pressure of 60 to 70 mm of mercury, they also pointed out that this indicates the possibility of maintaining cerebral circulation by this means

A case of complete recovery after arrest of twenty minutes was reported by Adams and Hand in 1942 A case has just been reported by the English surgeon Turner in which complete recovery took place after a somewhat prolonged period of dementia followed by progressively milder mental disturbances

Innervation of the heart and pericardium is of utmost importance in this connection Nerves of the pericardium include fibers from the phrenic nerve, especially the left one, also probably from the cardiac plexus The return of regular *sinus rhythm in a case described* by Touroff and Adelman occurred suddenly on clamping and traction of the pericardium This, in their opinion was not coincidental or fortuitous but indicative of a possibility that these procedures provided some potent stimulating reflex that induced prompt cardiac action The nature and pathway of this reflex merely can be assumed Coffey and his co workers have described a pathway from the pericardium via the phrenic nerve to the superior sympathetic cervical ganglion, and it is possible that a powerful stimulus traversing this pathway, served to initiate cardiac action It is not at all unlikely that the opening of the pericardium in my case similarly initiated cardiac function through reflex stimulation (see illustration)

SUMMARY

1 Cardiac and respiratory arrest is a complication, fortunately a rare one of the administration of anesthetics, particularly spinal

2 The increasing employment of spinal anesthesia makes it imperative for surgeons to be prepared for this emergency A complete outfit for the purpose should be at hand and the entire operating team should be rehearsed in its use

3 If the abdomen or the thorax has already been opened the surgeon can reach the heart directly If not, he is justified in opening the thorax If the heart has stopped or is fibrillating, he should begin cardiac massage instantly Speed is of vital importance

4 Three methods of manual massage are available and are described the standard method Nicholson's method and the intercostal approach of Lampson, which is useful in the treatment of fibrillation when complete arrest has not occurred

5 Other complications of anesthesia—ether convulsions and collapse of the patient—are discussed

6 A case is reported of a young woman under spinal anesthesia for an appendectomy in whom, before the operation was begun, there occurred cardiac and respiratory arrest The diaphragm and pericardium were opened and cardiac massage was instituted, together with intracardiac injections of epinephrine and the use of artificial respiration The total period of arrest was nineteen minutes Satisfactory activity of the heart having been resumed appendectomy was performed The patient remained in deep coma for four days and had a stormy postoperative course, but recovered completely and recently gave birth to a healthy child

7 [illegible] le end result is added ev

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*Since this article was written the patient has borne another child dence of the reversibility of cerebral damage resulting from prolonged anoxia.

8. The importance of reflex action through the pathway from the pericardium via the phrenic nerve to the superior cervical ganglion is emphasized.

9. Both clinical and experimental data support the concept of a gradient of susceptibility as the neuraxis descends from the cerebral cortex to the spinal cord.

RÉSUMÉ

1. Les arrêts cardiaques et respiratoires constituent une complication heureusement rare dans l'administration de l'anesthésie spinale.

2. L'emploi augmentant de l'anesthesie spinale demande que le chirurgien soit prêt à rencontrer ces accidents. L'outilliage complet pour cela devrait etre à porteé de la main et l'éq uipe operatoire doit etre exercée dans son emploi.

3. Si l'abdomen ou le thorax ont deja été ouverts, le chirurgien doit palper le coeur. Si non, il est justifie d'ouvrir le thorax. S'il y a arrêt du coeur ou fibrillation, on doit immédiatement masser le coeur. La hâte est essentielle.

4. Trois methodes de massage manuel sont décrites; la méthode standard, la méthode de Nicholson et celle de l'approche interscostal de Lampsonqui est utile dans le traitement des vibrations quand l'arrêt complet du coeurn'est pas survenu.

5. D'autres complications de l'anesthésie: convulsions d'éther et collapsus du malade, sont discutées.

6. L'auteur rapporte le cas d'une jeune femme qui sous anesthesie spinale pour appendicite, subit un arrêt cardiaque et respiratoire avant l'opération. Le diaphragme et le pericarde furent ouverts et le coeur massé. On administra des injections d'épinephrine et on eut recours a la respiration artificielle. La période d'arrêt dura 19 minutes. L'activite spontaneé du coeur ayant repris, une appendectomie futfaite. La malade demeura en coma pour 4 jours et eut une periode postopératoire tres sérieuse. Elle se retablit complètement et recemment donna naissance à un enfant bien portant.

7. Cette fin favorable est une évidance de reversibilité complète apres dommage cérébral résultant de profonde anoxemie.

8. L'importance d'action reflexe à travers la voie du pericarde via le nerf phrénique au ganglion cervical superieur est decrite.

9. La clinique et l'elude de laboratoire supporte la conception d'un degré de susceptibilite vu que le nevraxe descend du cortex cérébral à la moelle épinière.

ZUSAMMENFASSUNG

1. Herz- und Atemstillstand sind eine (gluecklicherweise seltene) Komplikation der Narkose, besonders der spinalen Anaesthesie.

2. Die wachsende Anwendung der Spinalanaesthesie laesst es unerlaesslich erscheinen, dass der Chirurg fuer derartige Notfaelle vorbereitet ist. Eine vollstaendige dem Zweck entsprechende Ausruestung sollte bereit und der gesammte Operationsstab mit ihrer Anwendung gut vertraut sein.

3. Wenn die Bauch- oder Brusthoehle bereits eroeffnet ist, kann der Chirurg das Herz direkt erreichen. Ist das nicht der Fall, so ist er berechtigt, die Brusthoehle zu oeffnen. Wenn das Herz aufgehoert hat zu schlagen, oder wenn es fibrilliert, sollte mit der Herzmassage unverzueglich begonnen werden. Eile ist lebenswichtig.

4. Drei Methoden der manuellen Massage stehen zur Verfuegung und sind beschrieben worden; naemlich das allgemein gebraeuchliche Verfahren, die Nicholsonsche Methode und der von Lampson angegebene interkostale Weg, der in der Behandlung des Herzflimmerns, wenn noch kein voelliger Herzstillstand eingetreten ist, von Nutzen ist.

5. Andere Komplikationen der Narkose wie Aetherkraempfe und Kollaps des Kranken werden eroertert.

6. Es wird der Fall einer jungen Frau beschrieben, die sich zum Zwecke der Appendektomie unter Spinalanaesthesie befand, und bei der, bevor die Operation begonnen hatte, Herz- und Atemstillstand eintrat. Das Zwerchfell und der Herzbeutel wurden eroeffnet und Herzmassage unter gleichzeitiger intrakardialer Einspritzung von Adrenalin und Anwendung von kuenstlicher Atmung begonnen. Die Gesamtdauer des Stillstands betrug 19 Minuten. Nachdem das Herz seine eigene Taetigkeit wiederaufgenommen hatte, wurde die Appendektomie ausgefuehrt. Die Kranke

verweilte vier Tage lang in einem tiefen Koma und ging durch eine stuermische postoperative Periode, erholte sich aber vollstaendig und gebar kuerzlich ein gesundes Kind

7 Dieses guenstige Endergebnis stellt einen zusaetzlichen Beweis fuer die Umkehrbarkeit von Hirnschaedigungen dar die als Folge schweren Sauerstoffmangels eintreten

8 Die Bedeutung des Reflexmechanismus auf dem Wege vom Herzbeutel ueber den Zwerchfellnerven zum oberen Halsganglion wird hervorgehoben

9 Sowohl die klinischen als auch die experimentellen Daten unterstuetzen die Auffassung dass waehrend der Axiszylinder von der Hirnrinde zum Rueckenmark hinabsteigt die Empfindlichkeit steigt

RIASSUNTO

1 L'arresto cardiaco e respiratorio e una complicazione felicemente rara nell amministrazione delle anestesie particolarmente l anestesie spinale

2 L impiego accrescitivo dell anestesia spinale costringe i chirurghi di essere preparati per questo avvenimento Un armamento completo per questo scopo dovrebbe essere sotto mano e l intero corpo operatorio ben recitato nel uso

3 Se l addomine od il torace siano gia apperti il chirurgo puo attaccare il cuore direttamente Altramente e giustificato dovrebbe cominciare subito il massaggio del cuore Velocita' e' essenziale

4 Tre metodi di massaggio manuale sono efficaci e qui descritti il metodo di NICHOLSON e l accesso intercostale di Lampson il quale e' utile nel trattamento di fibrillazione quando non occorre arresto completo

5 Descrive complicazione di anestesia convulsioni di etere e indebolimento del pazienti

6 Si rapporta un caso di una donna giovane sotto anestesia spinale per appendectomia nella quale innanzi che l operazione sia cominciato, si presentarono arresto cardiaco e respiratorio La diaframma ed il pericardio furono aperti e massaggio cardiaco cominciato insieme coi inizioni intra cardiaco di epinefrina e respirazione artifiziale Il tempo totale d'arresto era diecinova minuti L attivita' spontanea del cuore essendo ripreso, l'appendectomia fu eseguito La paziente rimaneva in coma profondo per quattro giorni, ed aveva corso postoperatorio tempestuoso, ma ha ricuperato interamente e recentamente dette nascita ad un fanciullo sano

7 Questo risultato compito favorevole e prova aggiunta della sopravvivenza del danno cerebrale risultando dell anossia profonda

8 L'importanza del processo riflesso a traverso il cammino dal pericardio via il nervo frenico al ganglio cervicale superiore e' accentuato

9 Tema clinico ed esperimentale sostiene il concetto di chinamento di suscettibilita come la neurasse discende dalla corteccia cerebrale al midollo spinale

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The **Pan-Pacific Surgical Association** will hold its Fifth Congress in Honolulu, Hawaii, Nov. 7 to 19, 1951. The purpose of the gathering is to bring together surgeons from countries bordering on the Pacific Ocean so that an exchange of surgical ideas and methods, as well as good fellowship, may prevail among the various peoples represented. This is an excellent opportunity to combine a vacation in Hawaii with attendance at a scientific meeting, the program of which bears the names of prominent international speakers. Information regarding the convention may be obtained from the Pan-Pacific Surgical Association. Suite 7. Young Building. Honolulu, T. H.

The **Congress of the International Society of Orthopaedic and Traumatic Surgery** will convene in Stockholm. May 21 to 25. 1951.

The two main subjects to be discussed are (*1*) Avitaminosis and Bone Changes and (*2*) Low-Back Pain and Sciatica: Results of Treatment.

Members of the Association are invited to present subjects of their own, which should be submitted to the Secretary of the Congress. Dr. Anders Karlen, Karolinska Institutets Ortopediska Klinik. Stockholm.

The **Fourth Pan-American Congress of Ophthalmology** will convene in Mexico City. Mexico. Jan. 6 to 12. 1952. An invitation is extended to ophthalmologists of the Western Hemisphere to attend and present papers. Communications should be addressed to Luis Sanchez Bulnes. M.D.. Secretary General, Fourth Pan-American Congress of Ophthalmology. la Gomez Farias. 16. Mexico 4. Federal District.

Stainless Steel Cranioplasty

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IN 1944 it occurred to us that 18-8 stainless steel, which had been used for many years by Babcock[1] and others as suture material and by orthopedic surgeons for bone plates might prove as satisfactory as tanalum for cranioplasty and would cost considerably less Accordingly experiments with this material were carried out on dogs and the results published in 1946[2] In these animals the reaction following stainless steel cranioplasty compared favorably with that reported after use of tantalum Moreover since stainless steel is readily obtainable and easily cut and shaped at the operating table, and since the price at that time of an average sized stainless steel plate was approximately one three hundredth that of a similar plate of tantalum (10 cents versus approximately $30), we suggested that stainless steel be given a thorough clinical trial *

We have attempted this, and we now report our experience with this material in 22 cranioplasties in human beings (Table 1)

At the time of writing we have not been able to find any report in the literature of a similar series of cases †

Operative Technic —The tools and material used are shown in Figure 1 The technic was a modification of that suggested by Gardner[3] for tantalum cranioplasty In all but 1 instance the plates were prepared directly in the operating room without preliminary fitting The plates were never inserted in the presence of infection or within six months after infection

The edges of the bony defect are freed from the dura (Fig 2*A*) Every effort should be made to conserve and repair dural defects by suture, by a periosteal or aponeurotic graft or by dural substitutes (polyethylene film or fibrin film) That this is not always essential can be seen in Cases 7 and 8 (Table 1) The edges of the bony defect may be beveled to permit the plate to lie flush with the outer surface of the skull, but this is not essential if the defect is within the hair line A rough pattern of the defect is then made from rubber dam polyethylene film or cardboard allowing approximately 5 mm of additional width along the edges While one member of the team is beveling the bone margins another fashions hammers and perforates the plate (Fig 2*B*) The plate is cut out of a stock piece of stainless steel with double action aviation shears (Fig 1) and is then shaped to the proper contour by hammering it with a mallet against the concave surface of a block of hard wood The plate is then fitted to the bone opening and properly trimmed to shape with double action aviation shears It is then placed in position in the bone defect and markings are made with a scriber ¼ inch (0 64 cm) back of the bone margins and corresponding points on the plate Holes are then drilled through each border of the bone with the aid of a hand drill and an Adson bone holding forceps (Fig 2*C*) The corresponding holes are then made in the plate with a double action punch (Fig 2*D*) An additional number of perforations may be made in any portion of the material to permit future fixation of the metal by ingrowing granulation and scar tissue and also to permit any serum to escape from under the plate A No 30 stainless steel suture is next inserted

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From the Department of Neurosurgery Temple University Hospital and Medical School Philadelphia

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*It is important when buying the material to order 18-8 Mo (1.75 2.50) stainless steel This contains roughly 16 to 18 per cent chromium and 10 to 14 per cent nickel and is fortified by molybdenum We use the 0 015 thickness and prefer the smooth finish

It is obvious that if these plates are ordered from a surgical supply house that wishes to make money on the plate the price may compare somewhat with that of tantalum The stainless steel should be obtained in lengths of 2 or 3 feet (60 96 to 91 44 cm) from a recognized dealer in stainless steel The price of the material when bought in such a manner is ridiculously low as compared with that of tantalum

†Adelstein has stated that since 1944 he has used stainless steel for cranioplasty in 6 cases The results have been excellent (personal communication Aug 8 1950)

Jaeger mentioned a case in which he placed a large stainless steel plate on top of the skull after removal of a meningioma in 1940 Reexamination of the patient in 1945 showed excellent healing (Discussion[3])

TABLE 1.—*Summary of Histories in 22 Cases of Stainless Steel Cranioplasty*

Case #	Name	Age	Sex	Race	Diagnosis	Indications for Cranioplasty	Date Inserted	Primary or Secondary Insertion	Location of Plate
1	M.W.	18	M	W	Lge. defect second. to removal infected bone flap elsewhere 5 yr. prev. Post-traum. convuls.	Protection, cosmetic, and possible relief of convulsions	5/30/45	Secondary 5 yr. after bone remov.	R. Fronto-parietal
2	J.G.	41	F	C	Comp. depressed fract. skull L. parietal	Bone defect due to injury	12/20/45	Primary	L. Pariet.
3	M.H.	53	F	C	Bilat. malignant exophthalmus	Maintain orbital decompression	7/12/45	Primary	R. Lat. orbit.
4	E.H.	48	F	W	R. Frontal meningioma	Defect secondary to removal of bone infiltrated by tumor	6/28/45	Primary	R. Front. parietal
5	E.R.	58	M	W	Old. comp. depress. fracture R. frontal	Bone defect, headache, cosmetic	4/1/46	Secondary 5 yr. later	R. Supra orbital
6	A.Y.	57	M	W	Old comp. depress. fracture R. frontal	Headache and vertigo, pulsation in defect	9/12/46	Secondary 16 mo.	R. Forehead
7	S.F.	50	F	W	Meningioma R. frontal	Bone infiltrated by tumor removed	10/28/46	Primary	R. Front-parietal
8	C.S.	10	M	W	Old trephine defect. R. temporal	Pulsation in defect, cosmetic (scar)	1/13/47	Secondary 2 yr.	R. Temp.
9	E.B.	33	F	W	Comp. depress. fract. frontal, seconary to gun shot injury	Protection, cosmetic	1/20/47	Secondary 5 mo.	Mid-forehead
10	K.R.	8	M	W	Old comp. depress. fracture L. parietal	Bone defect, protection	2/9/47	Secondary 8 mo.	L. Parietal
11	E.V.	45	M	W	Old comp. depress. fracture L. parietal	Bone defect, protection	10/31/47	Secondary 3 yr.	L. Parietal
12	E.S.	22	M	W	Epidermoid L. frontal	Defect after removal of tumor, cosmetic	2/1/48	Primary	L. Frontal
13	W.G.	23	F	W	Eosinopbilic granuloma R. frontal	Defect after removal of tumor, cosmetic	6/1/48	Primary	R. Frontal
14	O.S.	36	M	W	Comp. depress. fracture L. frontal	Defect, cosmetic	7/1/48	Primary	L. Frontal
15	M.A.	9	M	W	Comp. depress. fracture R. occipital	Defect with pulsation, protection	7/1/48	Secondary 1 yr.	R. Occipital
16	E.D.	15	M	W	Very lge. defect due to removal bone flap over subdural abscess	Huge defect, protection, cosmetic	11/5/48	Secondary 11 yr.	Almost entire L. skull
17	A.Z.	25	M	C	Defect secondary to operation for brain abscess	Defect, protection	11/8/48	Secondary 1 yr.	L. Frontal
18	A.S.	32	F	W	Large hyperostosing meningioma. R. frontal	Defect following removal of tumor	12/10/49	Primary	R. Fronto-temp.
19	L.T.	21	M	C	Large defect L. temp. front. secondary to decompress. for tr. intracerebral hematoma	Defect, protection, convulsions	6/4/50	Secondary 8 mo.	L. Fronto-temp.
20	B.S.	1	M	W	Pulsating exophthalmus due to craniostenosis	Reduce exophthalmus and prevent pulsation	5/4/50	Primary	R. Ant. & middle fossal
21	P.L.	40	M	W	Floating bone flap following previous craniotomy	Annoying to patient	2/4/50	Secondary 1 yr.	R. Front.
22	J.N.	24	M	W	Defect old depr. fracture R. Frontal	Protection, cosmetic	7/6/50	Secondary 3 mo.	R. Front.

TABLE 1—*Summary of Histories in 22 Cases of Stainless Steel Cranioplasty (Continued)*

Size of Defect	Cond of Scalp over Plate	Condition of Dura	Complications Following Cranioplasty			Follow Up	Unusual Symptoms	Results	
			Effusion over Plate	Infection	Removal			Symptomatic	Cosmetic
Large	Good	Intact	None	None	—	3 Yr	Hit on scalp over plate 9 mo later Unconscious few minutes	No improvement in convuls	Fair
Small	Good	Galeal graft	None	None	—	—	Cannot locate patient	—	—
Small	Good	Intact	None	None	—	5 Yr	None	Good	Good
Large	Good	Defect not repaired	Slight aspirated 6th day	Yes	Yes poor fitting & infection	—	Reop c̄ refitting 9 days after 1st op Rem 3 mo because of infection	Unsat	Unsat
Small	Extremely thin	Intact	None	None	—	4 Yr	None	Headache not relieved	Fair
Small	Ex thin at center of plate	Intact	None	None	—	4 Yr	None	Headache and vertigo relieved	Good
Large	Good	Lge defect not repaired	4 mo post-op c̄ spont absorptn	None	—	4 Yr	None	Good	Good
Med	Good	Thin incomplete repair CSF leak	None	None	—	3½ Yr	None	Good	Good
Large	Thin and scars	Large defect not repaired	None	None	Yes formation small sinus	—	Repeated formation small sinus in scalp after 3 attempts at repair	Good	Unsat but cov by hair
Small	Normal 'Y' scar	Intact	Mod two aspirations	None	—	3½ Yr	None	Good	Good
Small	Good	Intact	None	None	—	3 Yr	None	Good	Good
Small	Good	Intact	None	None	—	2½ Yr	None	Good	Good
Med	Good	Intact	None	None	—	2+ Yr	None	Good	Good
Small	Good	Intact	None	None	—	2+ Yr	None	Good	Good
Med	Thin	Intact	None	None	—	2 Yr	None	Good	Good
Very large	Good	Intact	None	None	—	2 Yr	None	No improvement in convulsions	Good
Med	Good	Intact	None	None	—	2 Yr	None	Good	Good
Large	Good	Lge defect not repaired	Persist effus since oper	None	—	8 Mo	Mod fluid collection under frontal scalp	Good	Fair
Med	Good	Intact	None	None	—	6 Mo	None	No improvement in convulsions	Good
Small	Good	Intact	None	None	—	6 Mo	None	Slight improv in pulsation	Fair
Med	Good	Intact	Slight aspiration	None	—	8 Mo	None	Good	Good
Small	Good	Intact	None	None	—	3 Mo	None	Good	Good

through the drill opening in the bone down to the dura, and then delivered by grasping it with a hemostat inserted between the bone and the dura. Sutures are placed in a similar manner through the other bone perforations, delivered and then inserted through their corresponding holes in the stainless steel plate (Fig. 2*E*). The plate is then firmly anchored to the bone by tying the sutures; usually four to eight are adequate (Fig 2*F*). The incision is closed in two layers without drainage in the usual manner.

Case Data

A summary of the case histories of 22 patients operated upon by the authors is given in the accompanying tabulations

TABLE 2.—*Indication for Cranioplasty*

A	Bone removed because of tumor infiltration (all plates inserted at primary operation)		5
	Meningioma	3	
	Eosinophilic granuloma	1	
	Epidermoid	1	
B	Bone removed because of depressed fractured skull		9
	Plate inserted at primary operation	2	
	Plate inserted at secondary operation	7	
C	Miscellaneous causes		8
	Removal elsewhere of infected bone flap	2	
	Orbital decompression malignant exophthalmos	1	
	Pulsating exophthalmos in an infant	1	
	Defect due to operation for brain abscess	2	
	Defect due to old decompression for traumatic intracranial hemorrhage	2	
	Total		22

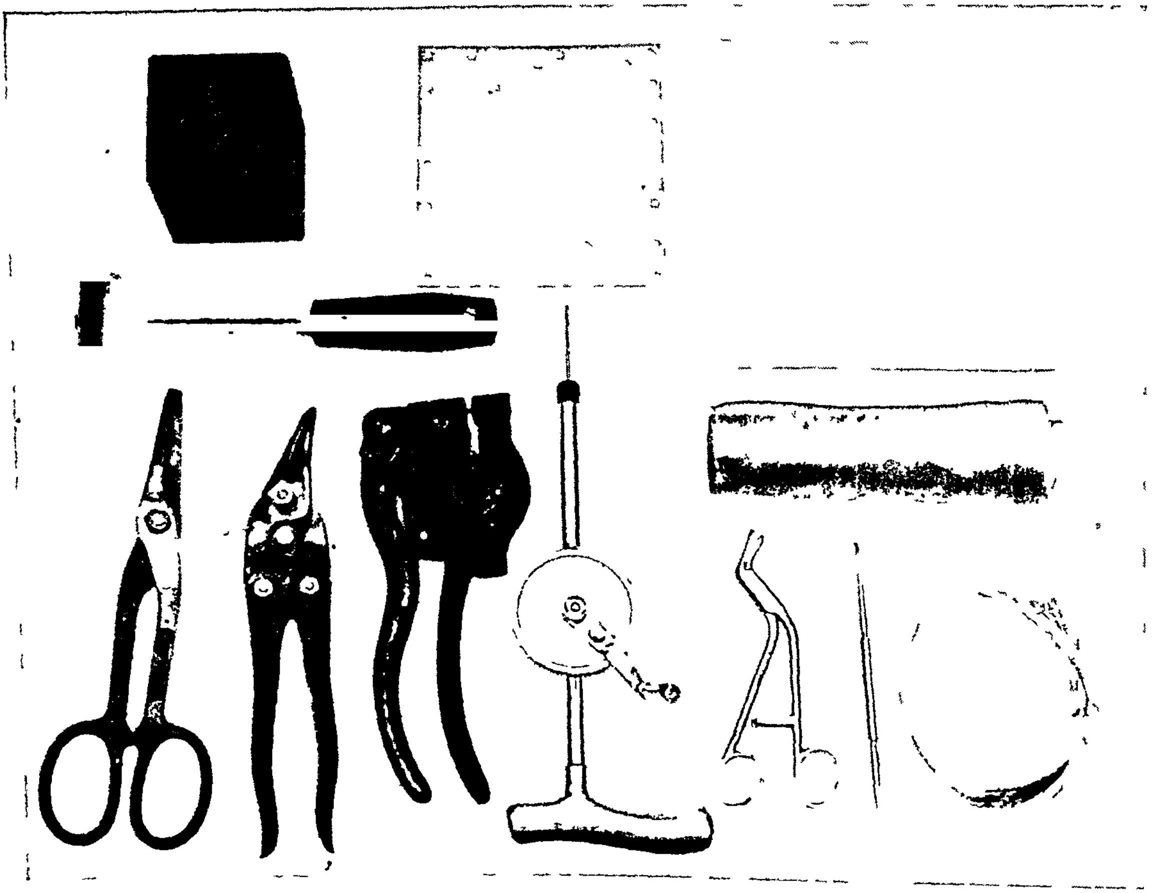


Fig 1.—Tools and materials used in shaping stainless steel plate at operating table *Upper row* (left to right), hammer, hardwood block with concave surface, perforated and unperforated stainless steel plates, and wire mesh *Lower row*, tinsmith's shears, double action aviation shears, double action punch (these three tools can be bought in any hardware store): hand drill; Adson bone holding forceps; scriber, and stainless steel wire

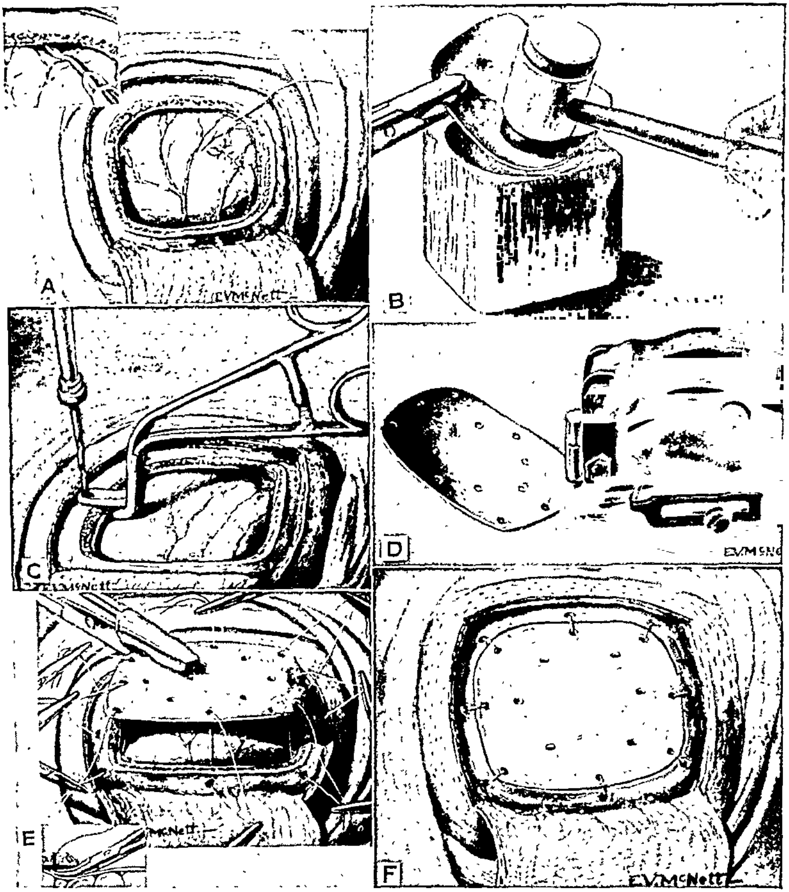


Fig. 2.—Technic of stainless steel cranioplasty (see text). *A*, any dural defect is repaired. Dura adherent to bone margin is released by a dural separator (see insert). Margin of bone is beveled. Pattern of defect is made from rubber sheeting. *B*, plate is cut from a stock piece of stainless steel. Perforations are made in center of plate and plate is fashioned to proper contour as illustrated. It is then fitted snugly to defect and markings for suture holes are made with a scriber ¼ inch (0.6 cm.) back of bone margins and corresponding points on plate. *C*, holes are d [illegible] lower lip of Adson bone holding forceps
stops drill when it [illegible] edge of plate are made with a double ac-
tion punch. *E*, 30 s [illegible] rill openings in skull (see insert) and
threaded through c [illegible] secured by tying off sutures. Incision is
closed in two layers with silk or stainless steel wire.

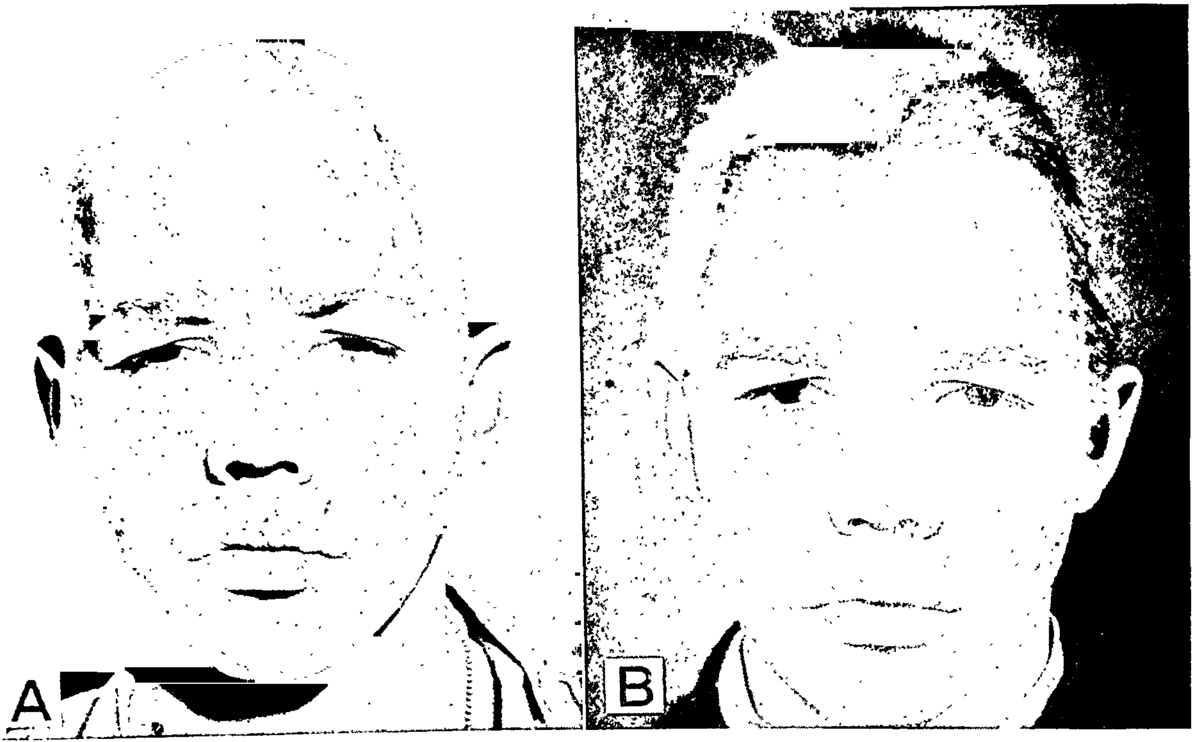


Fig. 3 (*Case 16*).—Large defect due to removal of bone flap eleven years earlier because of subdural abscess. *A*, before plating. *B*, after plating.

TABLE 3.—*Age Incidence*

Age in Years	*No. of Cases*
1-10	5
10-20	2
20-30	5
30-40	4
40-50	3
50-60	3

TABLE 4.—*Location of Defect*

Midforehead	3
Lateral-frontal	6
Lateral-orbital	2
Frontoparietal	3
Frontotemporal	2
Right temporal	1
Parietal	3
Occipital	1
Half of skull	1

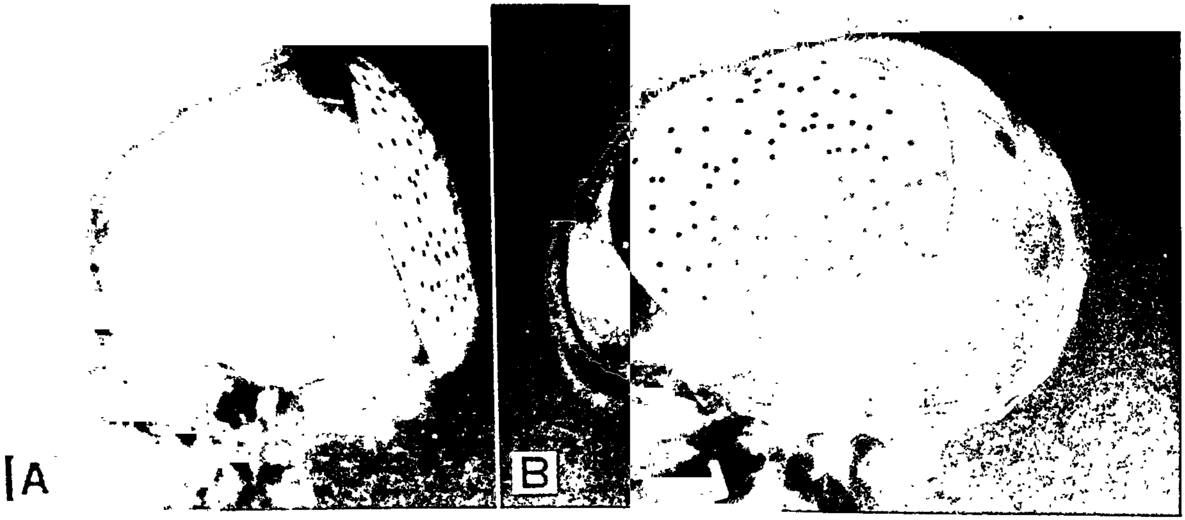


Fig. 4 (*Case 16*).—Plate in position. *A*, anterior view; *B*, lateral view.

TABLE 5.—*Diameter of Defect Cm.*

Small (3-5)	10
Medium (5-10)	6
Large (over 10)	6

TABLE 6.—*Condition of Dura at Cranioplasty*

Found closed		16
Large defect not repaired		4*
Tumor	3	
Gunshot wound	1	
Small defect repaired		2
Galeal graft	1	
Suture	1	

*A persistent effusion over the plate occurred in 1 case only (see Table 1).

TABLE 7.—*Complications following Cranioplasty*

None		16
Effusion over plate (transitory)		3
Spontaneous absorption	1	
One aspiration	1	
Two aspirations	1	
Effusion (persistent—8 mo.)		1
Removal of plate*		2
Infection of scalp	1	
Persistent sinus due to thin scalp	1	
Mortality		0

*White[4] stated that complications from plates made of tantalum, vitallium or lucite occur in practically the same proportion of cases; their incidence amounted to 10.6 per cent in Elkins and Holbrook's series of 66 cranioplasties with lucite and in 12.3 per cent in 130 cranioplasties with tantalum.

Lewin and his associates[5] reviewed a two year follow-up of 130 cranioplasties with tantalum and found that 11 plates (9 per cent) had to be removed, 5 because of infection, 4 for intracranial complications and 2 because of cosmetic failure.

Our incidence of 9 per cent plate removal with stainless steel compares favorably with the foregoing statistics.

TABLE 8.—*Duration of Follow-up*

No. of Cases	No. of Years
4	4 to 5
10	2 to 3
5	Less than 1
	Average—2.5 years

SUMMARY

1. Stainless steel cranioplasty has been done in 22 cases.

2. Two plates (9 per cent) had to be removed because of infection and sinus formation.

3. Nineteen of the patients have been followed an average of two and one-half years. In 1 patient a persistent effusion is present over the plate, owing to failure to close a large dural defect. The results have been entirely satisfactory in the remaining 18 cases.

TABLE 9.—*Results*

Plates inserted		22
Plates removed		2
Patients followed (average 2½ years)		19
Persistent effusion over plate		1
Clicking movement of plate	None	
Discomfort over plate in extremes of weather	None	
Convulsions relieved by cranioplasty	None	
Convulsions produced by cranioplasty	None	
Headaches relieved by cranioplasty	1	
Vertigo relieved by cranioplasty	1	
Cosmetic result		
Fair	4	
Good	1	

CONCLUSIONS

1. Experimental observations in animals by the authors and the clinical results obtained in this series of stainless steel cranioplasties show that this metal is as satisfactory as tantalum for the repair of cranial defects.

2. Since stainless steel can be cut, shaped and fitted at the operating table as easily as tantalum, and since the price of a tantalum plate 6 inches (15.24 cm.) square is $37 as compared with approximately 10 cents for a similar plate of stainless steel, the authors conclude that the use of tantalum for cranioplasty is wasteful and should be abandoned.

RÉSUMÉ

1. La cranioplastie à l'aide d'acier sans tache fut faite dans 22 cas.

2. Deux plaques (9%) furent enlevées dû à l'infection et la formation de sinus.

3. On a suivi 19 malades durant une période de deux ans et demi. Chez un malade il y eut effusion persistante au dessus de la plaque. Cela était dû à ce qu'on n'avait pas pû fermer complètement la plaie de la dure

mère. Les résultats furent tres satisfaisants dans les autres cas (18).

CONCLUSIONS

1. Les observations expérimentales chez les animaux baites par les auteurs montrent que les résultats obtenus avec l'acier sans taches, sont aussi satisfaisants qu'avec le tantale, pour la rèparation des défauts craniens.

2. Vu que l'acier sans tache peut être coupé, modelé, faconné et ajusté au cours de l'operation, aussi facilement que le tantale et que le prix d'une plaque de tantale 6x6 pouces (15.24x15.24 Cm) est de 37 dollars tandis qu'une plaque de même dimension d'acier sans tache revien a dix sous, les auteurs considèrent que l'emploi du tantale pour cranioplastie est un gaspillage et doit être abandonné.

RESUMEN

1. Se hicieron 22 cranioplastías con acero inoxidable.

2. Hubo que retirar dos placas (9 por ciento) debido a infección y fistulización.

3. Se siguió a 19 de los pacientes por dos años y medio aproximadamente. En un paciente hubo efusión persistente sobre la placa, debida a defecto de cierre en una gran pérdida dural. Resultados enteramente satisfactorios en los 18 casos restantes.

CONCLUSIONES

1. Observaciones experimentales en animales y los resultados clínicos obtenidos en esta serie de cranioplastías con acero inoxidable, muestran que este metal es tan satisfactorio como el tántalo (tantalum) para la reparación de pérdidas craneales.

2. Dado que el acero inoxidable puede ser cortado, conformado y adaptado en la propia mesa de operaciones tan fácilmente como el tántalo (tantalum) y la gran diferencia de precio, pues una placa de tántalo de 6 por 6 pugadas (15.24 por 15.24 cm.) cuesta $37.00 (moneda de los Estados Unidos) en tanto que una similar de acero inoxidable importa 10 centavos (moneda de los Estados Unidos) aproximadamente, los autores concluyen que el uso del tántalo para cranioplastía es oneroso y debería abandonarse.

ZUSAMMENFASSUNG

1. Schaedelplastiken mit rostfreiem Stahl sind in zweiundzwanzig Faellen durchgefuehrt worden.

2. Zwei Platten (9%) mussten wegen Infektion und Fistelbildung entfernt werden.

3. Neunzehn der Kranken sind durchnittlich zweieinhalb Jahre lang beobachtet worden. In einem Fall besteht ein hartnaeckiger Erguss ueber der Platte als Folge mangnelhaften Verschlusses eines grossen Duradefekts. In den uebrigen achtzehn Faellen sind die Ergebnisse voellig zufriedenstellend.

SCHLUSSFOLGERUNGEN

1. Experimentelle Beobachtungen der Verfasser an Tieren und die in dieser Serie erzielten klinischen Ergebnisse mit rostfreiem Stahl bei Schaedelplastiken zeigen, dass dieses Metall zur Schliessung von Schaedeldefekten genau so befriedigend ist wie Tantalum.

2. Da rostfreies Stahl am Operationstisch genau so leicht wie Tantalum geschnitten, geformt und angepasst werden kann, und da der Preis fuer eine 15,24x15, 24 cm (6x6 Zoll) grosse Tantalumplatte 37 Dollar im Vergleich zu 10 Cent fuer eine aehnliche Platte aus rostfreiem Stahl kostet, kommen die Verfasser zu dem Schluss, dass die Anwendung von Tantalum in der Schaedelplastik eine Verschwendung darstellt und aufgegeben werden sollte.

RIASSUNTO

1. Vengono riportati 22 casi di cranioplastia con acciaio non corrosivo.

2. Due lamiere furano ritirati per causa d'infezione e formazione di seno.

3. Osservando 19 casi per una terminezza di 2½ anni, risulta in un soggetto effusione persistent al traverso la lamiera causato al fallimento della chiusura d'un diffetto durale largo. I risultati in 18 casi rimanente erano interamente soddisfacente.

CONCLUSIONE

1. Osservazione esperimentali negl' animali, e risultati clinici dimostrano che in questa serie di cranioplastia con acciaio non corrosivo, questo metallo e' egualmente soddisfacente che Tantalo nel riparo dei diffetti del cranio.

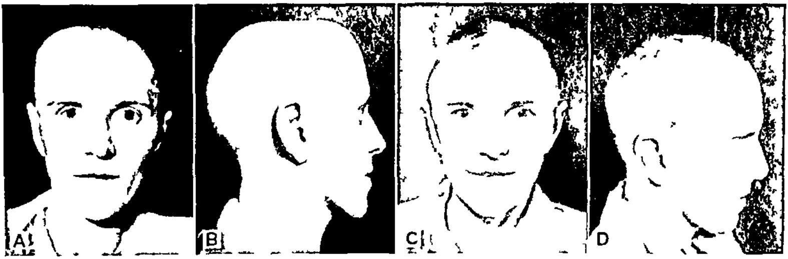


Fig 5 (*Case 18*).—Hyperostosing meningioma of right frontal parietal and temporal bone *A* and *B*, before operation Note mass in right frontal area *C* and *D*, after removal of tumor and insertion of plate

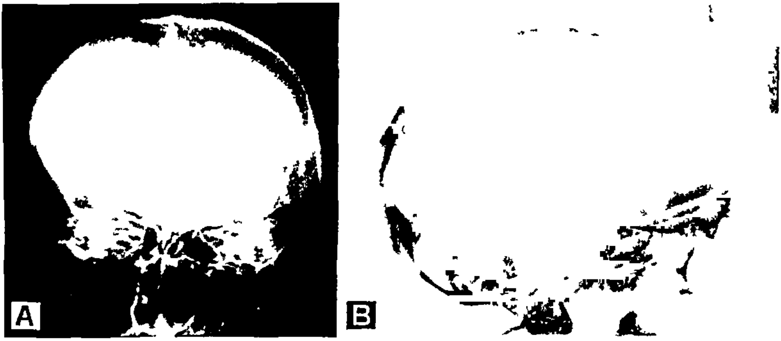


Fig 6 (*Case 18*) —Roentgenograms showing tumor *A* anterior view, *B*, lateral view

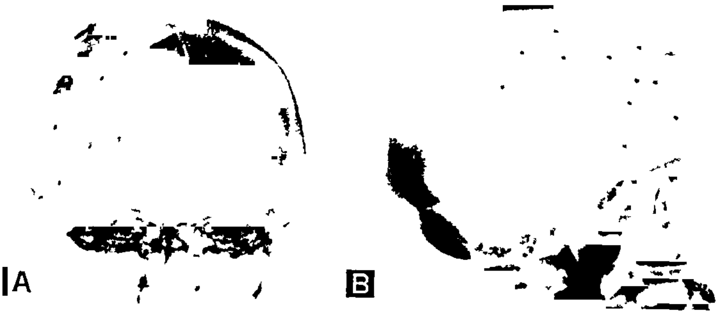
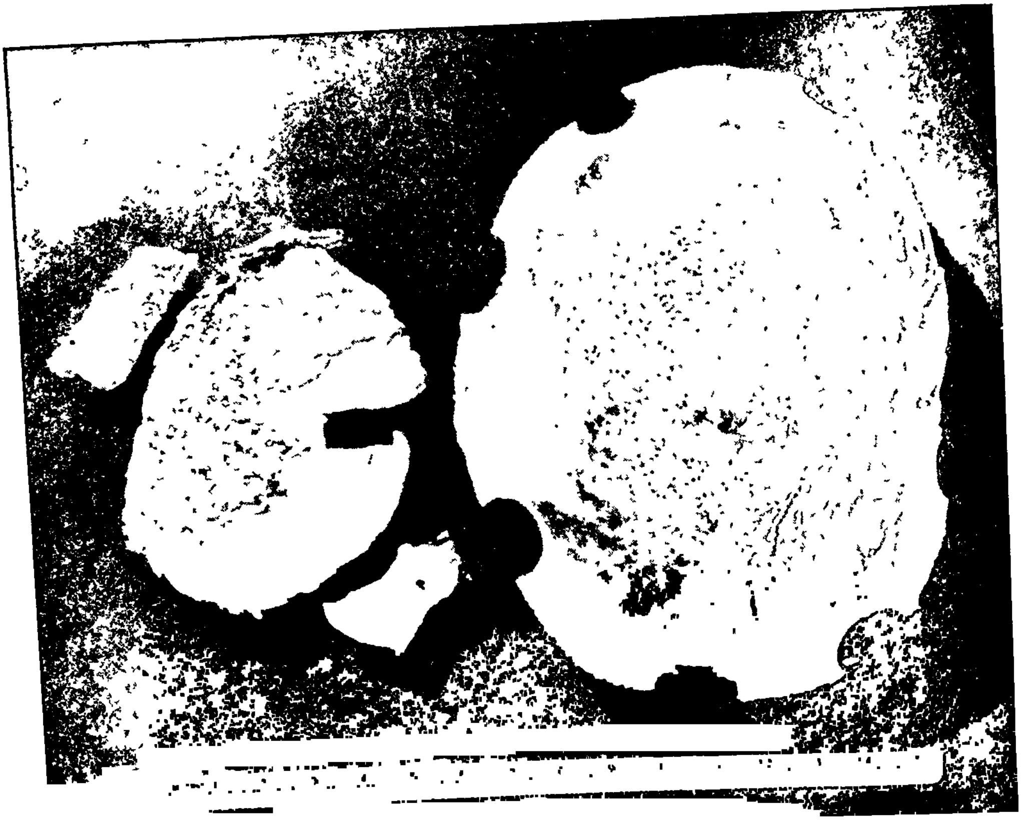
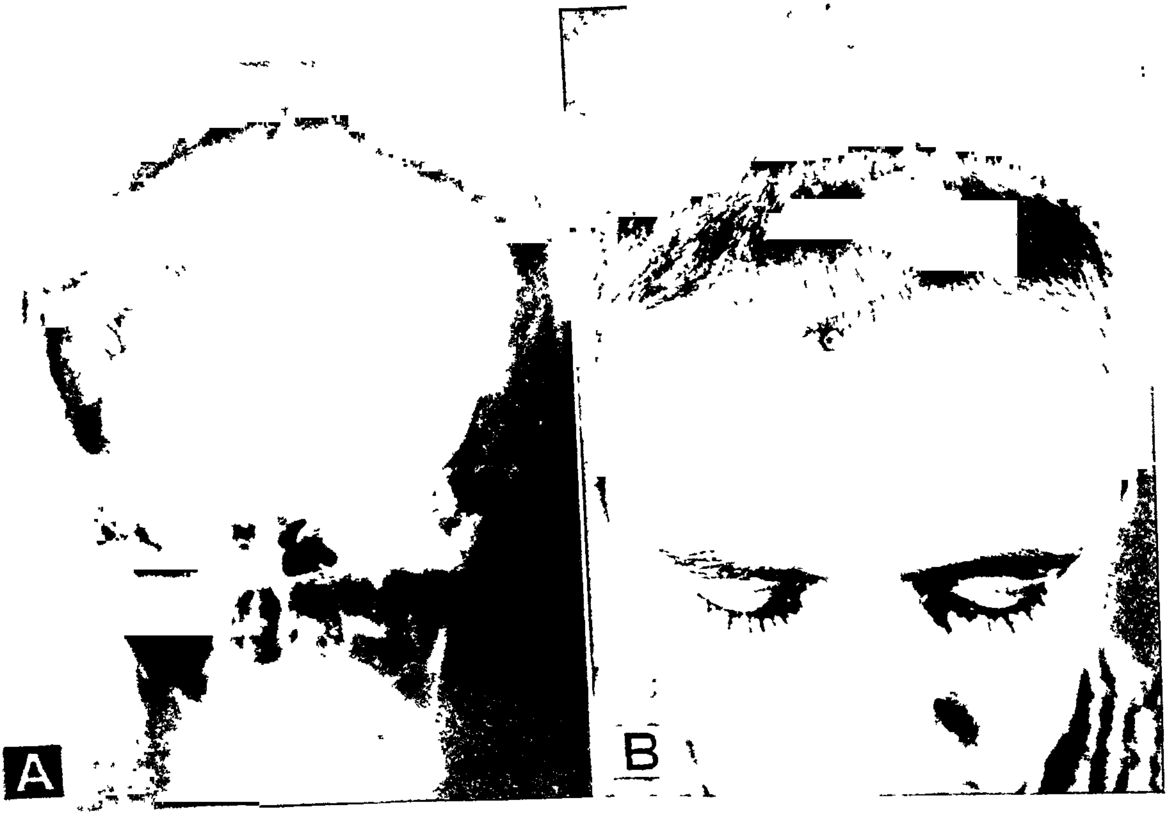


Fig 7 (*Case 18*) —Roentgenograms showing plate in place *A* anterior view, *B* lateral view




A
B

2. Poiche' l'acciaio non corrosivo si taglia, si forma, e si adatta sulla tavola operatoria così facile come il Tantalo; e siccome il prezzo della lamiera di Tantalo 15.24cm per 15.24cm costa $37 a paragone d'una lamiera d'acciaio non corrosivo simile, valuto a [illegible] centesimi, si conclude che l'uso del Tantalo sia stravagante e bisogno abbandonarlo. L'A pone in evidenza i vantaggi economici nel impiego d'acciaio non corrosivo.

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Fig. 8 (*Case 1*, opposite).—Photograph of gross specimen. Note invasion of dura.

Fig. 9 (*Case 3*, opposite).—Suicide attempt with shotgun, resulting in compound fracture of frontal bone and bilateral prefrontal lobotomy by the missile. The photographs show the cosmetic defect after removal of shattered bone and primary repair. *A*, roentgenogram of defect. *B*, Persistent sinus due to excessive thinness of scalp, resulting in removal of plate (see text).

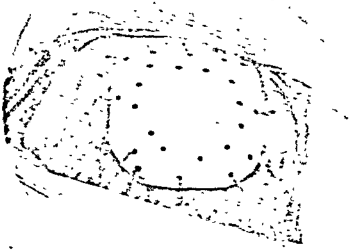

Fig. 10 (*Case 3*).—Plate inserted at second operation.

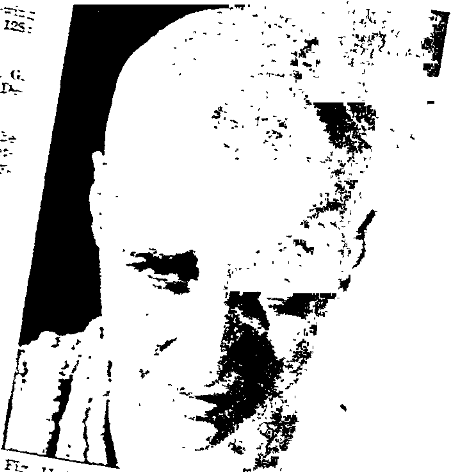

Fig. 11 (*Case 3*).—Outward appearance of defect.

F 11

The Education of the Biliary Surgeon

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IN the training of the young surgeon it is sometimes difficult to give him, or to see that he gets, a reasonably rounded perspective of the many problems he will face. This is true especially of surgery of the biliary tract. Lord Moynihan once said that no one should do biliary operations until he has had much surgical experience. How, then, is a young surgeon to learn biliary surgery? It is impossible to give all the trainees sufficient personal experience to familiarize themselves with most or all of the varied problems in this important field. We, as teachers, must by example and precept complete this education.

To learn the important day-by-day problems in biliary surgery I have analyzed from my files 100 consecutive operative cases of disease of the biliary tract. Many interesting points became apparent, but I have chosen for this discussion only those controversial aspects a young surgeon, and indeed all of us worry about.

Age and Sex: The series included 168 women with an average age of 49 years and 32 men with an average age of 51.4 years. Five women and 1 man were under 30, the youngest patient with gallstones being 22.

Symptoms: The average duration of symptoms prior to operation was four and seven-tenths years. It is interesting that all of the patients who had had symptoms for many years did not seek surgical relief until recurrent colic or some complication forced them to do so. Eighty-one of the patients had a colicky type of pain. Thirteen were jaundiced when first seen, and 6 had histories of recurrent icterus.

Roentgen Examinations: Cholecystograms were taken of 94 patients. A nonvisualizing gallbladder without stones was reported in 36. In 30 of these patients stones were present at operation. Stones were not found in 5 of these patients, but there was other local pathologic change. In only 1 patient were the operative observations (there was mild catarrhal cholecystitis) insufficient to explain the nonvisualization of the gallbladder preoperatively. This shows that a nonvisualizing gallbladder coupled with an adequate history of gallbladder disease almost always means gallstones or a functionless gallbladder.

Diagnosis: The main decision, as in all surgery, is whether exploration should be undertaken. In this series there were seven diagnostic errors (Table 1). With 5 of these patients the error was of no practical importance, because surgical intervention was of benefit. The sixth patient was a 54-year-old woman with a four-year history of pain in the right upper abdominal quadrant, with the usual symptoms suggesting disease of the gallbladder. Three cholecystograms at intervals revealed either a poorly functioning or a nonvisualizing gallbladder without stones. At operation a moderately thick-walled gallbladder without stones, a thin-walled dilated common duct without stones and a tight sphincter were observed. A diagnosis of biliary dyskinesia appeared clear. The seventh patient was a 73-year-old man in whom jaundice and ascites developed four months after a burn of 20 per cent of his body surface. The pathologist reported that the ascitic fluid showed some abnormal cells and that tumor could not be excluded. Although there was evidence to uphold the diagnosis of stone, cancer or serum hepatitis, operation was undertaken in the hope of relieving the jaundice if it were due to malignant obstruction. Hepatitis was present, and the subsequent course of the patient upheld that diagnosis.

Pathologic Picture: Eighty-four of the patients had stones in the gallbladder, in the common duct, or in both (Table 2). Thus, the most common problem confronting the biliary surgeon is the treatment of stones and the complications to which they lead. One ever-present problem is what to do with the patient with a functioning gallbladder containing a

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Read at the Fifteenth Annual Assembly of the United States Chapter, International College of Surgeons, Cleveland, Nov. 2, 1950.

Submitted for publication Nov. 12, 1950

TABLE 1 —*Diagnostic Errors*

Preoperative Diagnosis	*Postoperative Diagnosis*
Cancer pancreas	Cancer of liver
Chronic cholecystic disease with stones	Chronic cholecystitis with polyp and hepatitis
Chronic cholecystic disease with stones	Cholesterosis
Acute cholecystitis	Pancreatitis
Perforated duodenal ulcer	Acute cholecystic disease
Chronic cholecystic disease with probable stones	Dyskinesia
Obstructive jaundice	Hepatitis

single stone too large to pass into the common duct In this series 4 gallbladders with acute cystic duct obstruction due to one large stone, and 2 chronically infected gallbladders containing one large stone causing recurrent obstruction of the cystic duct were removed with resultant cure

Two patients with primary acute bacterial cholecystitis without stones were encountered There were 4 patients with primary carcinoma of the pancreas, and 1 with primary carcinoma of the liver One patient had serum hepatitis, and 1 had primary pancreatitis

Surgical Treatment In the approach to the gallbladder a variety of incisions was used A right rectus muscle splitting incision was made in 76 patients, a subcostal or transverse incision in 23 and a paramedian incision in 1 The choice of incision usually depended on the obliquity of the costal margin When it was wide a transverse or subcostal incision was used, and when the margin was more vertical than horizontal a right rectus incision gave better exposure A partial wound separation occurred once and a complete dehiscence once both of them with right rectus muscle splitting incisions

TABLE 2 —*Pathologic Observations*

Gallstones in gallbladder and/or common duct	84
Polyp of gallbladder	1
Primary bacterial cholecystitis	2
Primary cancer of pancreas	4
Primary cancer of liver	1
Primary pancreatitis	1
Primary hepatitis	1
Miscellaneous	6

TABLE 3 —*Surgical Observations*

Cholecystectomy	92
Exploration of common duct	33
Common duct stones with jaundice	6
Common duct stones without jaundice	11
Abnormality of duct	7
Abnormality of vessel	10
Resection of head of pancreas	1
Emergency cholecystectomy	15
Cholecystogastrostomy or duodenostomy	3
Incidental appendectomy	36

The most common operation was cholecystectomy (Table 3) This procedure was performed usually by dissecting the cystic duct and artery first, and removing the gallbladder from below upward Retrograde removal was done more often for acutely inflamed gallbladders and a combination of the two approaches was used when indicated Removal of the anterior wall of the gallbladder with cauterization of the wall embedded in the liver was done once Thirty three common ducts were explored because of jaundice or dilatation Stones were found in the common duct in 17 patients but only 6 of the patients had had jaundice Thus, there were 11 cases of so called "silent common duct stones " This important point cannot be stressed too strongly The stones were felt in only 2 of the cases which indicates that palpation cannot be relied upon to help the surgeon decide to open the common duct In 2 patients the common duct was explored after a previous cholecystectomy

Abnormalities of the extrahepatic duct system were demonstrated in 7 cases Variations of the vessel distribution were present in 10

One resection of the head of the pancreas was performed for cancer, with recovery Cholecystogastrostomy or cholecystoduodenostomy was done in 3 cases

Fifteen gallbladders were removed as emergency procedures The duration of symptoms was forty eight to seventy two hours All patients recovered

Incidental appendectomy was performed in 36 cases, without complications.

Operative cholangiograms were taken 4 times. Although surgeons should know the technic and interpretation of operative cholangiography, it is doubtful whether the surgeon doing an occasional gallbladder operation should attempt it. Its greatest benefits are in deciding whether to open the common duct and, after exploration, whether all stones have been removed. On the other hand, postoperative cholangiograms should always be taken before removal of the drainage tube, and this procedure was carried out in this series. Of the 33 common ducts explored, postoperative cholangiograms showed shadows suggesting residual stone or stones in 5. The patients were treated with cholagogues and antispasmodics and in addition were given instillations of ether. Since second cholangiograms showed a normal biliary tract, it is impossible to say whether the shadows were due to trapped air or to stones which passed into the duodenum under treatment.

Mortality: There was no surgical mortality. All of the patients with cancer of the pancreas or liver were dead within twelve months.

Complications: Postoperative complications occurred in 18 patients. The complications were mostly those which follow any major operation. Mild jaundice, probably due to edema and clearing in a few days, occurred twice. Hemorrhage into the bile and urine occurred once. Severe acidosis occurred once, and was due to loss of alkaline bile secondary to cholorrhea. The final important complication was the premature accidental removal of the T-tube by the patient or nurse. This occurred three times, on the seventh, ninth and tenth days respectively, but fortunately did not interfere with the patient's recovery.

SUMMARY

From this analysis there arise certain points which should be taught the surgical student:

1. Gallstones do occur in persons under 30 and should be considered in the differential diagnosis.

2. The two most important symptoms are pain and jaundice, either separately or together.

3. A gallbladder that cannot be visualized by cholecystogram, together with an adequate clinical history, in almost all cases means the presence of gallstones.

4. The exact diagnosis of disease of the biliary tract is difficult. If it is believed that exploration will benefit the patient and if there are no absolute contraindications, operate.

5. Other things being equal, the presence of gallstones is an indication for surgical intervention. This is true whether one stone or multiple stones are present and regardless of size.

6. Use the incision which gives the best exposure.

7. Removal of the gallbladder in an early stage of acute disease gives as good results as appendectomy for acute appendicitis.

8. The most common operation is cholecystectomy. The several methods of removing the gallbladder should be taught. Cholecystostomy was not done in this series. It should be reserved for the patient who is a very poor risk.

9. The common duct should be explored on any reasonable indication. Stones can be present in the common duct with or without pain and/or jaundice. It is better to explore without results than to operate.

10. Consider possible abnormalities of the duct and vessel systems. Expose adequately and dissect gently.

11. Know about and use cholangiographic procedures, both operative and postoperative, when indicated.

SUMMARY AND CONCLUSIONS

One hundred operative cases of disease of the biliary tract encountered in a private surgical practice are presented and analyzed. The answers to controversial problems as noted in these cases are given. Pasteur and Lister made surgery safe for the patient. During the past twenty-five years the better understanding of physiology has helped to make the patient safe for surgery. By never-ending attention to the teaching of the young surgeon, we must complete the cycle and continue to make the surgeon safe for both the patient and surgery.

RÉSUMÉ

L'auteur présente et analyse 100 cas qu'il a operés de maladie de la région biliaire. Ces cas

furent rencontrés dans une pratique chirurgicale privée et sont d'une importance particulière pour l'étudiant de chirurgie Ces cas sont nombreux et méritent d'être discutés Les calculs biliaires se rencontrent souvent chez les personnes âgées de moins de trente ans Une vésicule biliaire qui ne peut pas être visualisée par une cholecystogramme presque toujours indique des calculs biliqures à moins qu'il n'y ait contradiction par les faits cliniques La présence des calculs biliaires indique une intervention chirurgicale Dans l'opinion de l'auteur, l'ablation de la vésicule biliaire dans la maladie aigue de cette organe donne des résultats aussi satisfaisants que l'appendectomie dans l'appendicite aigue

ZUSAMMENFASSUNG

Der Verfasser berichtet und analysiert hundert operative Faelle von Erkrankungen der Gallenwege aus seiner chirurgischen Privatpraxis Er hebt einige Punkte hervor, die ihm von besonderer Wichtigkeit fuer den chirurgischen Forscher zu sein scheinen. Dazu gehoeren die Tatsache, dass Gallensteine im Alter von unter dreissig Jahren auftreten koennen, und die Beobachtung, dass Gallenblasen, die sich durch die Cholecystographie nicht darstellen lassen, fast immer auf die Anwesenheit von Steinen hinweisen, es sei denn, dass die Krankheitsgeschichte dagegen spricht

Er betont ferner, dass im allgemeinen das Vorhandensein von Gallensteinen eine Indikation zum chirurgischen Eingriff darstellt, und vertritt die Meinung, dass bei akuter Erkrankung die fruehzeitige Entfernung der Gallenblase ebenso guenstige Resultate zeigt wie die Entfernung des Blinddarms bei akuter Appendizitis

RIASSUNTO

L'A presenta ed analizza 100 casi operatorie di malattia delle vie biliari riscontrati nella clientela chirurgica privata Punti d'importanza particolari al studente chirurgicale sono catalogati ed accentuati, frattanto il fatto che calcoli biliari possono presentarsi nelle persone al di sotto di 30 anni, che la cistifellea che non si dimostra con la colecistografia, fuorché vi sia contra-indicazione anammesi, quasi sempre indica calcoli biliari, e benché, tutto sia uguale, la presenza di calcoli biliari propone l'intervento chirurgica Nell'opinione delA l'estirpazione della cistifella, ad una fase precoce della malattia risulta egualmente buono che l'appendectomia per l'appendicite acuta

The wish that anything may be true, powerfully influences the mind toward finding it true. A researcher in pure science is usually far less influenced by prejudices and wishes than is the investigator who is aware of the practical results of his findings. Even the pure scientist is, however, likely to be prejudiced in favor of a theory that he himself has proposed or espoused. His reputation depends upon its being verified, hence in his selection of facts and interpretation of results, he is unconsciously prejudiced This tendency to error has, however, a natural corrective Other scientists may make their reputation by finding defects in old theories and in proving new ones. It has now become a recognized principle that evidence of the truth of a theory presented by one man cannot be accepted as reliable, even as to the facts given in its support, until others have made the same observations and experiments with the same results This is especially required when the facts reported seem not in harmony with well-established theories.—*Edwin A. Kirkpatrick*

Thrombocytopenia Purpura

A Review of Fifty-Three Cases

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THIS paper deals especially with the hypersplenic disease idiopathic thrombocytopenia purpura—a condition caused, according to present concepts, by some abnormal function of the spleen, either by destruction and phagocytosis of platelets therein or by some remote humoral effect upon the megakaryocytes in the bone marrow. The disease may be cured by splenectomy in many instances, but the results of this procedure are often most discouraging. Thrombocytopenic purpura is a treacherous disease, often fatal when there is persistent severe thrombopenia associated with hemorrhagic manifestations.

A universal physical sign of idiopathic or secondary thrombocytopenia is ecchymosis of the skin and capillary or frank bleeding from the mucous membranes and serous surfaces. Blood transfusions are used to replace the lost blood. In a number of cases of idiopathic thrombocytopenic purpura spontaneous regression occurs, particularly in patients of the younger age group. Others fail to respond spontaneously, and on these splenectomy has been performed. In selecting cases for operation, careful analysis should be made of the complex factors involved in hemostasis and hemopoiesis. Among these factors the following, when present, are considered generally as offering a good prognosis in the event of splenectomy: (*1*) a not too severe type of anemia, readily combated by transfusions; (*2*) a normal or elevated neutrophil count in the peripheral blood; (*3*) hyperplastic bone marrow in which megakaryocytes are plentiful and mature, and (*4*) a high eosinophilic index.

In a certain number of conditions diagnosed as idiopathic thrombocytopenia purpura and presumably satisfying all or most of the above criteria it is common to find no improvement after operation, and even death may occur postoperatively. Percentages of cure following splenectomy vary with different authors.

Our experience in the past sixteen years has been derived from a review of 53 cases.

1. Of the 53 cases reviewed in our hospital files, conditions in 41 were found to be compatible with the diagnosis of thrombocytopenic purpura.
2. Of these 41 cases, 23 met all hematologic criteria of history, physical data and laboratory evidence to substantiate the diagnosis of primary idiopathic thrombocytopenic purpura. There were 15 female and 8 male patients in this group. The age range was 2 to 63.
3. There were 19 cases of secondary purpura due to drug reactions or allergic sensitivity or secondary to malignant disease or leukemia.
4. Of the 23 patients, 11 came to operation and 12 did not. Of the 11 patients who underwent operation, 6 died; 5 were cured or definitely improved. Of the 6 patients who died, 4 presented clinical and hematologic data offering a poor prognosis. Splenectomy was performed with the hope of a favorable ultimate outcome.
5. Further analysis of the cases shows that female patients below the age of 25 appear to have the best spontaneous improvement rate. They are the best operative risks, whereas older male patients with a history of hemorrhage and prolonged bleeding time appear to be the worst risks. In fact, of the 12 patients not operated upon, 7 showed spontaneous improvement, all were below 19 years of age (4 girls and 3 boys).

When the bone marrow shows no evidence of maturation of immature megakaryocytes and delivery of mature platelets into the peripheral

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circulation without any apparent cause the diagnosis of idiopathic or primary thrombocytopenic purpura is maintained This type of condition may lead to a severe hemorrhagic diathesis and such sequelae as hematuria epistaxis menorrhagia and bleeding from mucous and serous surfaces which if persistent may result in death However when surgical intervention is indicated it is important to remove the spleen and all accessory splenic tissue to prevent a recurrence of the condition One patient presented six accessory spleens in addition to the normal spleen This is also true in cases of hypersplenism associated with hemolytic anemia and panhematocytopenia In the latter an overactive bone marrow apparently compensates for increased destruction of mature elements in the circulating blood

It is now essential in the treatment of all blood dyscrasias to include a hematologist in the team A bone marrow biopsy is an important examination leading to a knowledge of the megakaryocytes When they are immature and insufficient, a rather definite diagnosis and prognosis can be made According to Welch and Dameshek, the spleen normally has some control over the bone marrow For the best operative results in a case of thrombocytopenia purpura there should be an abundance of megakaryocytes

The spleen is not necessary for normal human life It has been proved many times after traumatic rupture of the spleen, an accidental injury requiring its removal, that the patient may lead a healthy existence The irony of all this is the fact that when the spleen becomes pathologic it can do great harm and even destroy life Doan stated that the spleen is physiologically an unstable organ but pathologically an important one The reason for this change is not easily explained When the spleen destroys too many red blood cells the result is the condition known as hemolytic jaundice When it destroys too many or all of the platelets in the blood thrombocytopenia follows

The indications for operation in cases of hypersplenism have narrowed materially in the past few years They are congenital and acquired hemolytic icterus, idiopathic thrombocytopenic purpura (with criteria as aforementioned) tumors, chronic hemolytic anemia, and panhematocytopenia and neutropenia with a hyperplastic bone marrow picture Our results show that patients in the older age groups with initially low platelet levels had poor operative responses These patients showed no postoperative rise in platelets and no clinical improvement after the spleen was removed The majority of fatalities occurred within ninety six hours after the operation

The abdominal route was used for all splenectomies performed for any of the blood dyscrasias mentioned Usually a left rectus incision was employed Perfect hemostasis is necessary for operation upon thrombocytopenic patients We have not found it necessary to employ the thoracoabdominal approach for these patients because the spleen is usually mobilized readily through an abdominal incision

The relation of the degree of morbidity to platelet levels does appear to be a factor of importance in prognosticating the outcome of splenectomy In the experience of one of us if the patient has an initial average of 80 000 to 100 000 platelets the prognosis appears to be better than for a patient with an initial level of 20 000 or less The platelet level varies with the technician particularly at these low levels and an accurate count by a reliable technician is essential When the platelet level is low the mortality increases and in the presence of a low platelet level the other criteria mentioned should be most carefully considered before the patient is accepted for splenectomy

Fifty three cases in which a diagnosis of thrombocytopenia purpura had been made were reviewed Of these more than half were discarded because they did not fulfill all the diagnostic criteria for thrombocytopenia

All followed a somewhat uniform pattern, there was bleeding from some structure such as a lining mucous membrane or the bleeding took the form of petechiae scattered irregularly over the surface of the skin Bleeding originated in the form of hematemesis epistaxis tarry stools or oral and uterine hemorrhages

The blood exuded may be in small quantities or large enough to constitute a hemorrhage In the terminal states there are massive hemorrhages which may fill the pleural sac the subdural and subarachnoid spaces the abdominal cavity and many organs of the body, such as the kidneys, liver and other solid structures.

The most favorable cases were those in which the bone marrow showed megakaryocytic activity. When no megakaryocytes or only a few were present, the patients were always in considerable danger with or without operation. After operation, without megakaryocytes, death resulted from splenectomy in a few hours to a week. The lesson learned was that without an active bone marrow splenectomy should not be performed.

Some interesting premonitory phenomena were developed, but without a blood count paying particular attention to the number of platelets the diagnosis of thrombocytopenia purpura could not have been made. In many of these patients the spleen was not enlarged. The fragility test was of some importance in helping to make the diagnosis, showing increased resistance in most cases.

One outstanding recovery was that of a 14-year-old girl with menorrhagia. This was her only symptom. She had a deficiency of blood platelets. After the spleen was removed, the platelet count advanced to 800.000 in two months.

A woman, after hysterectomy, bled almost continuously from the incision in the vagina. A blood count showed a marked reduction in blood platelets. After a stormy convalescence, splenectomy finally restored her to health.

A revealing fact is that one-third of the patients accepted were children of ages ranging from 2 to 14 years. In addition, there were several adolescents. Spontaneous recovery was the rule for this group. The overall age range was from 2 to 63 years.

Thrombocytopenia purpura develops more often in the female than in the male, but with a better incidence of recovery.

SUMMARY AND CONCLUSIONS

1. This paper considers the hypersplenic disease thrombocytopenia purpura, the exact cause of which is not known.
2. The symptoms of the idiopathic and secondary types are identical.
3. Some patients in the younger age groups recover spontaneously.
4. A good prognosis after splenectomy depends on certain criteria, which are discussed.
5. A brief review of 53 cases is included.
6. It is important to remove all accessory spleens in addition to the spleen itself. In 1 patient six accessory spleens were removed.
7. In these days of specialization it is important to have a hematologist associated with the internist and the surgeon.
8. Curiously enough, the spleen is not essential to normal health but when it becomes pathologic it is a dangerous organ.
9. The indications for splenectomy have narrowed considerably in the past few years.
10. The results have been discouraging for patients with low platelet counts.
11. All splenectomies in this particular group were done by the abdominal route.

RÉSUMÉ

1. Les auteurs discutent la maladie hypersplénique purpura thrombocytopénique; la cause exacte de cette maladie n'est pas connue.
2. Les symptômes des formes idiopatiques et secondaires sont identiques.
3. Les malades d'âge peu avancé se rétablissent spontanément.
4. Un bon pronostic après la splenectomie dépend sur certains critères, que l'auteur discute.
5. Une revue brève de 53 cas étudiés est incluse.
6. Il est important de faire l'ablatiom de toute rate accessoire ainsi que de la rate. Dans un cas de cette serie, on enleva 6 rates accessoires.
7. A notre âge de spécialisation, il est bon d'associer un hématologiste avec l'interniste et le chirurgien.
8. Quoique la rate ne soit pas essentielle pour la santé normale, quand elle est pathologique, elle présente un grand danger.
9. Dans les dernières anneés, les indications pour la splénectomie sont moins nombreuses.
10. Les résultats chez les malades dont les plaquettes sanguines sont diminuées, sont decourageants.
11. Toute splénectomie de cette série fut faite par la voie abdominale.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Die Verfasser eroertern die thrombozy-

topenische Purpura eine hyperplenische Erkrankung, deren genaue Ursache unbekannt ist

2 Die Symptome der idiopathischen und der sekundaeren Form der Erkrankung sind die gleichen

3 Manche Kranke der juengeren Altersgruppen genesen von selbst

4 Eine gute Prognose nach Resektion der Milz haengt von gewissen Kriterien ab die in dieser Arbeit eroertert werden

5 Ein kurzer Ueberblick ueber die 53 eroerterten Faelle ist eingeschlossen

6 Es ist wichtig ausser der eigentlichen Milz alle ueberzaehligen Milzen zu entfernen In einem Falle dieser Serie wurden 6 ueberzaehlige Milzen reseziert

7 In unserem Zeitalter der Spezialisierung ist die Zusammenarbeit des Haematologen mit dem Internisten und dem Chirurgen von Wichtigkeit

8 Die Milz, die zwar zur Erhaltung des normalen Gesundheitszustandes nicht unentbehrlich ist, stellt doch, wenn sie erkrankt ist, eine Gefahr dar

9 Die Indikationen zur Resektion der Milz sind in den vergangenen letzten Jahren erheblich eingeengt worden

10 Bei Kranken mit einer niedrigen Blutplaettchenzahl sind die Erfolge entmutigend

11 Alle Milzresektionen in dieser Serie wurden auf abdominalem Wege durchgefuehrt

RIASSUNTO E CONCLUSIONI

1 L'AA discutono purpura trombocitopenia malattia ipersplenica la causa esatta la quale non e'conosiuta

2 I sintomi dei tipi idiopatici e secondari sono identici

3 Ce ne sono dei pazienti nel gruppo piu giovane che ricuperano spontaneamente

4 Una buona prognosi postsplenectomia dipende su certi criteri i quali sono discussi in questo articolo

5 Una breve rivista di 53 casi considerati e rinchiuso

6 E importante il rimovimento di tutte milze accessorie in aumento della milza se stessa In 1 caso in questa serie sei milze accessorie furono rimossi

7 In questi giorni di specialita' bisogna avere un ematologista associato col internista ed chirurgo

8 Benche' la milza non e essenziale alla salute normale quando diviene patologica la sua presenza e' pericolosa

9 Le indicazioni per splenectomia hanno considerabile ristringimento do pochi anni passati

10 I risultati nei pazienti con conto basso delle piastrine sono stati sconfortanti

11 Tutte le splenectomie in questa serie sono state per via addominale

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Laennec, even during his lifetime, was the recipient of many eulogies Perhaps none touched him more than that of the great writer Chateaubriand, who said "By means of a tube applied to the external parts of the body our learned Breton compatriot Dr Laennec has succeeded in recognizing by the quality of the sounds of respiration the nature of the diseases of the heart and of the chest This beautiful and great discovery will mark an epoch in the history of the art If one could invent a machine for hearing what takes place in a man's conscience that would also be useful for the days in which we live 'It is in his spirit that a physician should find remedies,' another physician has said in his ingenuous maxims and the work of Dr Laennec proves the justness of this observation —*Ralph H Major, M D*

Transplantation of Psoas Muscle in Correction of Urinary Incontinence

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NUMEROUS methods have been conceived for the surgical correction of urinary incontinence. It has been estimated that relatively a hundred procedures have been devised or considered for the correction of this condition. The purpose of every method is to create voluntary controllable evacuation of the urinary bladder. All these methods are plastic surgical procedures utilizing noncontractile tissue and/or striated muscle tissue to produce the desired sphincteric control. It has been repeatedly demonstrated that the faculty of closing the urethra is not effective in every instance. It is the purpose of this contribution to present a method permitting voluntary occlusion of the urethra dependent on contraction of psoas muscle.

Plastic procedures utilizing noncontractile tissues make use of fibrous structures existing near the urethra, and the end results are usually not satisfactory. Such a procedure frequently necessitates the use of certain surgical technics to create obstacles hindering the outward flow of urine from the bladder. These hindrances are produced by making the urethra longer, by twisting it on its axis or by occluding its opening. Plastic procedures utilizing noncontractile tissue do not completely obstruct the urethra; they are effective only when the sphincter is partially preserved. It has been repeatedly demonstrated that, when the sphincter is impaired or totally absent, urinary dribbling is constant even when the bladder is partially filled. In spite of the operation, therefore, it often becomes necessary to resort to various surgical appliances to prevent constant dribbling.

In contrast, a plastic procedure utilizing striated or contractile muscle tissue aims to close the urethral canal by compression of these muscles. This method should, in theory, produce more effective results than do methods utilizing noncontractile tissues, because of the normal contractability of the muscles employed. In some operations for correction of urinary dribbling the contractile muscle may be greatly displaced from its normal anatomic position; this tends to limit the effectiveness of the surgical procedure. The contractile function of this muscle tissue may be partially or completely destroyed as the result of displacement. Surgical trauma or impairment of innervation and/or nutrition may so hamper the transplanted muscle tissue as to render it functionless. Muscles lacking innervation and nutrition ultimately become transformed partially or wholly into fibrous cords incapable of compression of the urethra.

A method of correction of urinary incontinence was presented by me some years ago.* Research has continued until it is now believed that this method presents important advantages over others suggested for the correction of this condition. This technic was originally presented before the Societa Italiana di Urologia (Rome, 1947).

The procedure consists of two principal factors; first, utilization of the psoas minor muscle, and second, free transplantation of a strip of fascia lata from the thigh. The strip of fascia lata, 22 to 26 cm. long, is necessary to lengthen the tendon of the psoas muscle (Fig. 1). The tendon so lengthened is passed obliquely from above posteriorly to the symphysis pubis and is continued beneath that portion of the urethra which is located immediately beneath the symphysis, to be anchored by sutures to the tissue on the anterior surface of the symphysis on the opposite side. The urethra lies in the dependent portion of the elongated psoas tendon (Fig. 2). Contraction of the psoas muscle causes the urethra to be

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* "Un nuovo indirizzo operativo per la terapia di alcuni prolassi e ptosi." in Rivista Italiana di Terapia," 1932, No 1.—"Sulla possibilita di accertare preventiamente l'esistenza del muscolo piccolo psoas in ordine alle operazioni id pessia." in "Rivista di Chirurgia," 1936, No. 6.

compressed against the inferior margin of the symphysis. Sufficient pressure is exerted on the urethra to prevent incontinence, yet the pressure is not sufficient to produce necrosis. The urethral compression although vigorous is not harmful or in any way destructive. It is suggested that adipose tissue be placed between the posterior aspect of the symphysis pubis and the strip of fascia lata to act as a buffer. The psoas minor muscle lying behind the peritoneum does not alter its direction of action in performing its new function.

I have performed this operation three times. In each instance excellent results were obtained.

This surgical procedure is done in a region of the body in which infection is commonplace and difficult to prevent. It is imperative to prevent postoperative infection. This applies also to all plastic procedures or tissue transplantations. However, in the method presented the tissues used are viable and have not been subjected to previous trauma. The procedure as described does not necessitate unusual displacement of the psoas muscle, so that innervation and nutrition remain normal. This last detail is very important.

The innervation of the psoas muscle arises from the first lumbar roots. The innervation of the muscle which was used in earlier plastic procedures is derived from the low lumbar or the sacral roots as is the innervation of the bladder. Consequently, if vesical innervation is impaired, the muscle tissue whose innervation arises from relatively the same levels would likewise be subjected to some impairment.

One very important fact must be always considered. The psoas minor muscle may be absent. In such instances a portion of the psoas major may be used. In utilizing the psoas major muscle, particular attention must be given to preventing injury to the femoral nerve. Nor should a large enough portion of the muscle be used to interfere with normal function of the thigh.

It might be possible to obtain even greater pressure on the urethra by suturing the fascia lata to the abdominal muscles at the upper anterior margin of the symphysis pubis after it passes beneath the urethra. Or the fascia lata could be placed in such a position as to increase compression by rotation of the urethra on its longitudinal axis. In my opinion these measures are technical excesses without real practical advantage. A greater effect from such utilization of the psoas muscle may be obtained by suturing the fascia lata, after it is passed beneath the urethra, to the upper anterior margin of the symphysis on the side from which the muscle was used. In this manner twisting of the urethra as well as compression would occur during muscle contraction. These factors seem, however, to be technicalities without practical advantage.

The indications for this procedure are many, the contraindications are few. It is believed, in fact, that there are no contraindi

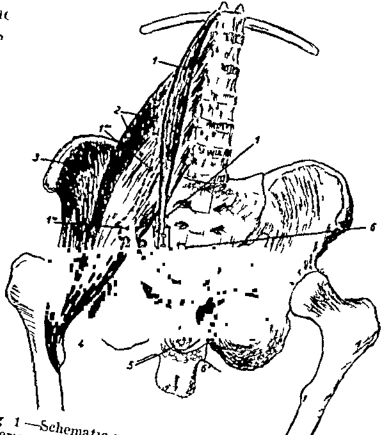

Fig 1.—Schematic representation of operative results, anterior view. 1, psoas minor muscle. 1', tendon of psoas minor muscle, displaced to middle and sutured to upper end of border of fascia lata. 1'', natural insertion of psoas minor muscle. 1''', first situation of psoas minor muscle (dotted lines). 2, psoas major muscle. 3, iliac portion of iliopsoas muscle. 4, outer iliac vessels. System of tendon of psoas minor muscle. Transplanted part of fascia lata takes middle position in respect to these vessels. 5, urethra and adjoining organs. 6 and 6', transplanted part of fascia lata. Sutured from upper end (6) to tendon of psoas minor muscle, it descends behind pubis, forming a handle embracing urethra and adjoining structures, then ascends in front of pubis, near which its lower end (6') is fixed by stitches.

cations, except age, circulatory disturbance, general physical debility, poor nutrition and infection, that would prevent one from attaining a successful result. All these factors are considered in connection with any elective operative procedure. Psoas abscess associated with tuberculous infection of the spine definitely precludes this type of surgical intervention. Loss of both limbs by amputation would also preclude it, since the necessary strip of fascia would not be available. Any condition that causes serious alteration of the skin of the lower part of the abdomen would also be a contraindication.

The advantage of this type of surgical procedure is that muscle tissue is utilized without altering its normal functional action, and the nutrition and innervation of the muscle is preserved. The results are excellent. It is believed that such procedures should be used in all instances of urinary incontinence except those in which the condition is slight or relative, with the sphincteric function fairly well retained. Under these circumstances a satisfactory result may be obtained by simpler and less extensive procedures. However, failure of the simpler methods of intervention is believed to be a clear-cut indication for use of the psoas minor muscle. This is true particularly when further surgical intervention is considered. Locally the tissues and their relations are altered postoperatively, which would tend to prevent satisfactory results. It is believed that the selection and preference of any procedure should depend on the condition of the patient and the experience of the surgeon. By the results obtained it is believed that this procedure warrants its use whenever a plastic procedure for the correction of urinary incontinence is desired.

As has been stated, I have performed it on three occasions, in the last case about one year ago. In all 3 cases the results were satisfactory. The third patient, a woman in rather weak physical condition, presented a rather difficult problem. She complained of continuous urinary dribbling. The maximum vesical capacity was 20 cc. Owing to complete absence of the psoas minor muscle, it was necessary to use a portion of the psoas major. After the operation a hematoma developed at the site of suture of the fascia lata, anterior to the symphysis. An abscess also developed in the gluteal area after a hyperdermic injection. With drainage and administration of antibiotics these areas healed without further complications. The vesical capacity is now 300 cc. (one year after the operation). The patient

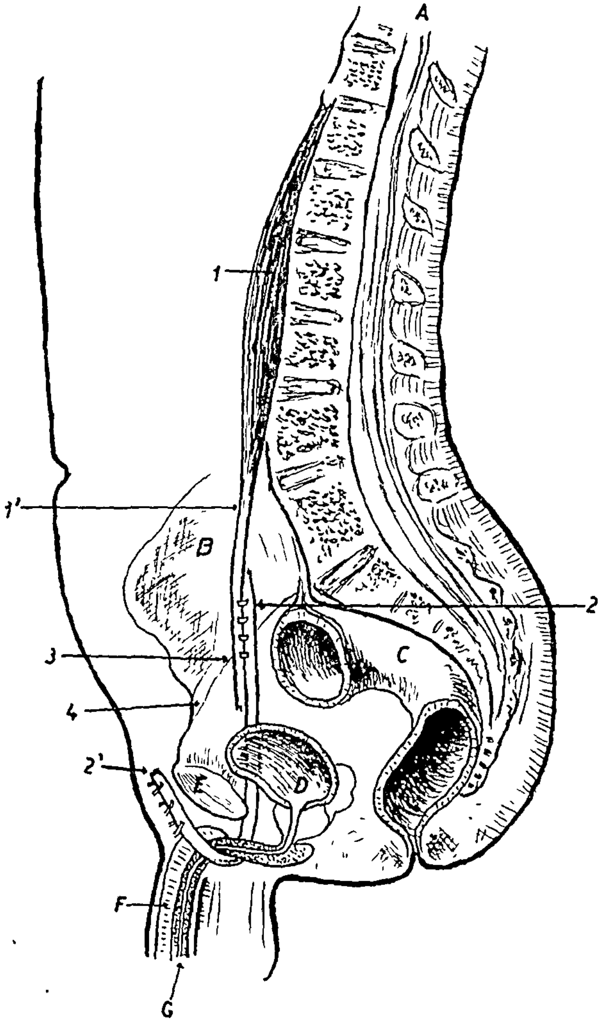

Fig. 2.—Schematic representation of operative results lateral view. *A*, rachis. *B*, iliac wing. *C*, rectum. *D*, urinary bladder. *E*, section of pubic symphysis. *F*, deep parts of penis. *G*, urethra and corpus spongiosa. *1*, psoas minor muscle; *1'*, tendon of psoas minor muscle sutured to part of fascia lata (*2*). *2* and *2'*, part of fascia lata sutured to *1'*, coming down *behind* pubis to form handle around urethra, then going up *in front* of pubis (from opposite side), where it is fixed. (Points of extremity (*2'*) touch only part of the fascia. This is a reminder that they involve tissues located in the opposite half of the pelvis, not represented in the drawing.) *3*, linea innominata. *4*, original anatomic insertion of tendon of psoas minor muscle.

is able to retain urine for four to five hours and voids without difficulty. There is no dribbling of urine.

It may seem premature, in view of the few patients operated on to suggest such a procedure, but it is hoped that other surgeons will make use of it in view of its therapeutic efficiency and its practical usefulness.

SUMMARY

The author briefly explains why the numerous methods used for the treatment of urinary incontinence by restoring the faculty of closing the urethra are not always effective. Then, referring to his previous reports made to the Italian Urological Society at its Congress in Rome in 1947, he recalls how he operated satisfactorily in a few other cases by the method he suggests. This consists in making the occludibility of the urethra dependent on the contraction of voluntary muscles, the function and nutrition of which remain intact.

RÉSUMÉ

L'auteur decrit brièvement les nombreuses méthodes employees pour le traitement de l'incontinence urinaire afin de restaurer la faculte de fermer l'urethre, ces methodes ne sont pas toujours efficaces. Faisant allusion a un rapport récent qu'il fit a la Sociéte Urologique Italienne au Congrés de Rome en 1947, il rapporte comment il a operé avec satisfaction plusieurs cas par la méthode qu'il recommande. Cette methode consiste en obtenant l'occlusion de l'urethre a l'aide de contraction des muscles volontaires dont la fonction et la nutrition restent intactes.

RIASSUNTO

L'A. spiega brevemente perche i metodi numerosi, impiegati nel trattamento della incontinenza orinario presso di ristabilire la facolta della chiusura dell 'uretra non sono sempre efficaci. Allora riguardo il rapporto pecedente alla Societa Urologica Italiana al Congresso di Roma 1947, egli richiama come ha operato con successo in altri pochi casi per la maniera suggerita. Cioe fare dipendere la chiusura dell 'uretra alla contrazione dei muscoli volontari, la funzione e nutrizione rimanendo intatto.

RESUMEN

El autor explica brevemente porque los numerosos metodos terapeuticos para la incontinencia urinaria, restauradores de la facultad continente uretral, no son siempre efectivos. Hace referencia a este respecto de su comunicación anterior a la Sociedad Italiana de Urologia, Congreso en Roma en 1947, recordando cuan satisfactorios han sido algunos otros casos operados por el metodo que él sugiere. Este consiste en hacer depender la continencia uretral de la contraccion de los musculos voluntarios, cuya funcion y nutricion permanecen intactas.

ZUSAMMENFASSUNG

Der Verfasser erklaert in Kuerze warum die zahlreichen, in der Wiederherstellung der Schliessfaehigkeit der Harnroehre bestehenden Behandlungsmethoden der Harninkontinenz nicht immer wirksam sind. Er beruft sich unter Bezugnahme auf seinen Bericht an die Italienische Urologische Gesellschaft auf dem Kongress in Rom in Jahre 1947 auf einige andere mit der von ihm vorgeschlagenen Methode erfolgreich operierte Faelle. Sein Verfahren besteht darin, die Schliessbarkeit der Harnroehre von der Kontraktion willkuerlicher Muskeln deren Funktion und Ernaehrung intakt sind, abhaengig zu machen.

In the sphere of Nature's laws it is only the minimal things that are worth caring about: mere specks on the wall of Life, so it seems to you. But one sets one's eyes to them, and behold, they are chinks that look out on Infinity.—*Havelock Ellis*

The Cooper Ligament Operation for Inguinal Hernia

LEIGH F. WATSON, M.D., F.I.C.S.*
LOS ANGELES

WITH the Cooper ligament operation there has been a lower percentage of recurrences than with the inguinal ligament operation (Bassini); hence, this procedure is steadily supplanting the latter in popular favor among surgeons, although the Bassini procedure presents fewer technical difficulties.

Narath is believed to be the first to have sutured the internal oblique and transversalis fasciae to the Cooper ligament. Lotheissen in 1898 published the general details of the operation, which he considered the method best adapted to the femoral hernia region. He did not realize its full value for inguinal hernia.

It remained for Babcock to recognize the many advantages of suturing the fascia to Cooper's ligament. After using the operation for some time he published his technic and results in 1927 and called attention to the fact that suturing Cooper's ligament closed the area of greatest weakness, that is, the lower inner angle—the site of most recurrences.

Anson and McVay in 1938 published their [illegible]es on this subject together with the opera[illegible] results secured by McVay.

[illegible]is operation preserves the normal unhampered action of the fascia and muscles of the inguinal region. It is now known that the Bassini operation interferes with normal movement, thus weakening the lower part of the abdominal wall and favoring rather than preventing recurrence. Since [illegible] lower fibers of the transversalis and th[illegible] oblique fasciae are normally attac[illegible] fibrous [illegible]ng of the pubic bone, [illegible]tum [illegible] superior (Cooper's [illegible]d [illegible]guinal ligament. [illegible] tion of Babcock [illegible] [illegible]eurose[illegible] of t[illegible]

oblique and the transversalis fascia to Cooper's ligament.

The reluctance of some surgeons to adopt this operation is due in part to their unfortunate experiences with nonabsorbable suture material or their unwise attempts to use nonabsorbable suture material as freely as if it were absorbable catgut. This operation is best carried out with silk or cotton sutures, thus involving a special technic. Material of the smallest size is to be preferred: stitches should not be too close together: continuous sutures should never be employed: all ties and knots should be cut short so as to leave a minimum amount of nonabsorbable material in the wound, and ligatures should be used sparingly.

Cutaneous Incision.—A straight incision is made nearly parallel with the inguinal ligament and ½ inch (1.25 cm.) above, extending from the internal ring to the lower middle part of the external ring and, in large hernias, to the upper middle part of the scrotum, just below the external ring. The length of this incision should be 2 to 3 inches (5 to 7.5 cm.) in children and 3 to 4 inches (7.5 to 10 cm.) in adults.

When the incision is deepened, the superficial epigastric and superficial circumflex iliac veins are seen crossing the field. These veins should be picked up and divided between hemostats. Some surgeons prefer to ligate them at once with fine silk or cotton. However, I do not like to leave ligatures in the fat; I prefer to let the forceps remain in place until the operation is finished, at which time they can be remove[illegible] [illegible]ithout causing further bleeding, provided [illegible] the wound is not roughly wiped with ga[illegible] [illegible] the terminal clots are not loosened.

To ex[illegible] [illegible]'s ligament properly the incision [illegible] [illegible]ended considerably lower [illegible]an that [illegible] the inguinal ligament [illegible]ini) [illegible] It should curve down- to [illegible] [illegible] of the scrotum.

[illegible]*rnal Oblique.*—After [illegible] [illegible]eurosis, one should

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[illegible] [illegible]ry, Rush Medi[illegible] [illegible] Professor o[illegible] [illegible] School, Okla[illegible] [illegible] 1950.

locate the external ring. If this external ring is not visible, it can be found by palpating the cord where it crosses the pubic bone as it leaves the external ring, and by following the cord upward with a director or other blunt instrument. If infiltration anesthesia is used, the aponeurosis is exposed and the injection made therein at the upper end of the proposed line of incision.

The aponeurosis is now incised in the direction of its fibers from a point near the internal ring to the external ring, and if the operation is done with infiltration anesthesia the next step is to locate the ilioinguinal and iliohypogastric nerves and to block them at as high a level as possible. The incision should be made as far from the inguinal ligament as is practical, so as to provide a wide upper flap for overlapping when the wound is closed. It is always advisable to cut through the pillars of the external ring, as this facilitates resection of the sac and repair of the canal. Some surgeons prefer to cut the aponeurosis on a grooved director inserted upward through the external ring for a distance of 2 to 3 inches (5 to 7.5 cm.), a practice to be condemned because of the danger of cutting the ilioinguinal nerve. A better method is to nick the aponeurosis near the internal ring and cautiously divide it in the direction of its fibers until the external ring is reached.

Dissection of the Aponeurosis and Anterior Rectus Sheath.—The inner edge of the external oblique fascia is retracted. On the medial side the dissection is continued until the arching of the internal oblique is seen. The rectus muscle and the fascia are exposed. On the outer side the dissection is continued until the inner shelving margin of the inguinal ligament is well exposed for a distance of 2 to 3 inches (5 to 7.5 cm.), down to the pubic tubercle.

On the medial side the inner layer of the anterior rectus sheath is exposed and split for a distance of 2 to 4 inches (5 to 10 cm.) to within ½ inch (1.25 cm.) of the pubic spine. The internal oblique muscle should be cut merely to the outer side of the linea alba, which it forms along with the external oblique. This makes it possible to suture the internal oblique fascia and its attached transversalis fascia to Cooper's ligament without undue tension.

Freeing the Sac.—The contents of the inguinal canal are grasped with forceps and lifted to a point just above the external ring. The cremaster muscle and the cremasteric fascia are incised and dissected from the sac and cord. Next, the layer of infundibuliform fascia, which covers the sac and cord, is incised, permitting the sac to be separated easily from the cord.

Ligation of the Sac.—When operating with local anesthesia it is a good plan to inject the neck of the sac before transfixing and ligating it. For a small hernia traction is applied on the sac, and a transfixing ligature of medium silk or cotton No. 30 is passed through the neck of the sac well within the internal ring. Before the ligature is tied the sac should be pulled down and held open for inspection to make sure that no portion of the omentum, intestine or bladder is caught in the ligature, which is then tied at a high level while traction is applied on the sac. If the neck of the sac is large, a purse-string suture is often more satisfactory than a simple ligature. If the sac is ligated high enough there will be a good "spring-back" of the stump, which will be drawn up inside the internal ring by the elasticity of the peritoneum.

Deep Sutures to Cooper's Ligament.—The most important step of the operation is the suturing of the transversalis fascia to Cooper's ligament. If the hernia is large, the aponeurosis of the internal oblique fascia is also sutured to the ligament. *At no time is the red* muscle of the internal oblique included in the sutures. If the red muscle is stitched, it quickly "cuts out" and paves the way for early recurrence of the hernia. The cord should be handled as little as possible. It should be retracted with an instrument that does not compress it rather than by the common practice of passing a strip of gauze beneath it, which may cause torsion of the cord when the latter is replaced in the internal ring next to the peritoneum. Traumatism of the cord is responsible for most of the after-pain as well as for the occurrence of epididymitis, orchitis, and, on rare occasions, thrombosis and embolism.

With the cord gently retracted to the inner side, the first stitch is taken in the form of a purse-string suture of the fascia around the internal inguinal ring with heavy silk or cotton No. 30. A similar partial purse-string stitch in the transversalis fascia closes the internal ring around the spermatic cord. A heavy silk or cotton No. 20 suture on a round-pointed full-curved needle is passed through the transversalis fascia and the aponeurosis of the internal oblique. Next, the needle passes outward through the thickened Cooper ligament along the upper border of the pubic ramus. This stitch is usually taken about 2 inches (5 cm.) from the spine of the pubis, while the femoral vessels are protected by the surgeon's index finger on the crest of the pubic bone. The highest stitch is placed first and tied, usually 1 to 2 inches (2.5 to 5 cm.) laterally from the pubic spine. This procedure is to protect the femoral vessels. The two sutures closest to the pubic spine pass through the lacunar (Gimbernat's) ligament as well as Cooper's ligament. In all, four or five sutures are used, and they should be No. 5 heavy braided silk or No. 20 cotton. The knots of the tied sutures should be cut very close. If the femoral vein is difficult to locate or if there is a large Rosenmüller's gland, it is advisable not to attempt to carry the sutures more than half way between the pubic spine and the femoral vessels.

In order to make the opening as small as possible, all fat and other tissue should be dissected away from the cord and nothing allowed to remain but the vas deferens, the artery, the nerve and the veins. After the deep sutures are tied, a stitch is placed above the cord as recommended by Coley (W. B.), and passed through the upper part of the internal ring to narrow and strengthen the ring, thus lessening the danger of recurrence. The internal ring should be closed as snugly as possible around the cord, there being little danger of making it too tight. If there is any question on this point, however, pulsation in the spermatic artery may be tested by palpation.

Care must be exercised to avoid tying the sutures too tight and to guard against puncturing the deep epigastric and external iliac vessels.

Closing the Aponeurosis of the External Oblique.—The cord is replaced on its new floor, which is formed by the internal oblique and the conjoined tendon. The cut edges of the aponeurosis are freed from fatty connective tissue and sutured together from above downward by interrupted sutures of silk or cotton No. 40, leaving just enough room in the new external ring for the cord. The flaps of aponeurosis are overlapped from above downward in a double-breasted fashion to strengthen the aponeurotic covering of the new inguinal canal and to take the strain off the deep sutures.

Closing the Subcutaneous Tissues and the Cutaneous Incision.—The fat is brought together with interrupted sutures of fine silk or plain cotton No. 80, and the skin incision is closed by interrupted or mattress sutures of fine silk or plain cotton No. 80. When the cosmetic result is important, it is best to use a subcuticular suture.

Disadvantages of the Cooper's Ligament Operation.—Many surgeons maintain that the Cooper's ligament operation is more difficult than other operations for inguinal hernia, and they have cited the following objections: it is more difficult to expose Cooper's ligament, because of its location; there is more danger of injuring important blood vessels; there is danger of temporary edema of the leg on the side of the operation; Cooper's ligament is at times small and undeveloped and cannot be depended upon; it is often difficult to obtain adequate support for the inguinal ring, which makes it necessary to use additional supporting sutures after the fascia has been sewed to Cooper's ligament, and the operation takes more time than do other procedures.

SUMMARY

The author discusses the advantages and disadvantages of the Cooper ligament operation in the treatment of inguinal hernia. The operative technic is described in detail, with special attention to suturing requirements. It is emphasized that this operation preserves the normal unhampered action of the fascia and muscles of the inguinal region.

RIASSUNTO

L'A. discute i vantaggi e gli svantaggi dell'operazione del legamento di Cooper, opera-

zione che sta diventando sempre piu popolare La tecnica operativa viene descritta in dettaglio

RESUME

L auteur discute les avantages et les désavantages de l'operation de Cooper, du ligament pour le traitement des hernies inguinales La technique opératoire est décrite en details avec l attention speciale sur les necessites de sutures Cette opération d'apres l auteur préserve l'action normale du fascia et des muscles de la région inguinale

RESUMEN

El autor discute las ventajas y desventajas del procedimiento operatorio del ligamento de Cooper en el tratamiento de la hernia inguinal Se describe en detalle la técnica operatoria con especial atencion en lo que atañe a la sutura Se señala que esta operación preserva la accion correcta normal de la fascia y musculos de la región inguinal

ZUSAMMENFASSUNG

Verfasser eroertert die Operation des Cooperschen Ligaments ihre Vorzuege und Nachteile Die Technik wird eingehend beschrieben und auf die staendig wachsende Beliebtheit des Verfahrens wird hingewiesen

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Announcement

INTERNATIONAL BOARD OF OCCUPATIONAL SURGERY

The Executive Council of the United States Chapter and the Board of Trustees of the International College of Surgeons have unanimously approved the formation of an International Board of Occupational Surgery, the aims of which are (*a*) elevation of standards for the practice of occupational surgery, (*b*) conservation of the health of the worker after occupational injury, (*c*) official recognition of this specialty, (*d*) stimulation of interest in this field by students and members of the profession and (*e*) cooperation in the establishment of facilities for graduate education in occupational surgery by means of residencies in hospitals affiliated with medical schools, or their equivalents

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For further details, address Dr Arnold S Jackson, Secretary, United States Chapter, International College of Surgeons, 1516 Lake Shore Drive Chicago 10 Illinois

Impacted Fractures of the Neck of the Femur

GEORGE J. GARCEAU, M.D., F.I.C.S., AND HARVEY W. SIGMOND, M.D., F.A.C.S.
INDIANAPOLIS

IMPACTED fractures of the anatomic neck of the femur are given little consideration by the authors of textbooks on fractures. All agree that if impaction is maintained union will occur. About half recommend nailing; the other half recommend no operative treatment. Because of the impaction, it is our opinion that the treatment demands specific consideration. Once disimpaction occurs, the advantages in treatment of this fracture are lost. The peril of disimpaction is very real. This catastrophe can occur with alarming ease during nailing with a three-flanged nail. Impaction is observed in less than 10 per cent of fractures of the anatomic neck of the femur.

The mechanism of fracture is most commonly that of falling with the body weight on the greater trochanter, thus impacting the fractured ends. A second mechanism is that of wide abduction and deep extension of the hip. Simple rotation of the femur may produce a fracture but cannot cause impaction. The impaction is usually on the superior aspect of the fracture line and frequently on the posterior surface.

Our discussion is based on a study of 50 patients with impacted fractures of the anatomic neck of the femur. The story is different from that of unimpacted fractures. There is frequently a history of weight bearing on the affected limb for a few steps or even for a few days. The diagnosis of sprained hip is frequently made. The patient is able to lift the extended leg in spite of pain. The limb can be actively rotated. No external rotation deformity is present, and there is no appreciable shortening.

Accurate diagnosis is made only by roentgen examination; therefore, pain about the hip following a fall or other injury demands roentgen study. Anteroposterior and lateral views are necessary for a complete diagnosis. The lateral view is taken through the perineum. The well hip is flexed out of the way. The lateral view will show rotation of the femoral head (if present) and the general alignment of the head with the neck of the femur. The two views will help to determine the depth of impaction. This information is required to determine the most advantageous treatment.

Since only certain impacted fractures are suitable for nonoperative treatment, the classification and description of these fractures is important. The criteria for classification are (*1*) the degree of impaction and (*2*) the relation of the femoral head to the femoral neck. Impaction up to ¾ inch (1.9 cm.) may be observed on the films. Impaction of less than ¼ inch (0.6 cm.) is not satisfactory for nonoperative treatment.

Pauwels' classification of abduction and adduction fractures is based on the angle formed by a line drawn through the anterior-superior iliac spine and another drawn through the fracture line. If the angle is 30 degrees or less the lesion is called a Pauwels I fracture. A Pauwels II fracture is one with an angle of 30 to 50 degrees, and an angle of 50 to 70 degrees indicates a Pauwels III type of fracture. In fractures of the Pauwels I type the stress is conducive to impaction.

According to our classification, these fractures are of three types:

Type I. Subcapital abducted fractures, soundly impacted and with good alignment of the femoral head to the femoral neck. These are usually of the Pauwels I type.

Type II. Cervical impacted fractures, with or without abduction, with good alignment. These may be Pauwels type II or III.

Type III. All other impacted fractures of the neck of the femur with malalignment.

The treatment selected in each case depends on the type of fracture. Many orthopedic surgeons prefer internal fixation for all fractures of the femoral neck. We do not unalterably oppose this practice, but in our opinion internal fixation is often unnecessary.

From the Orthopedic Service, St. Vincent's Hospital, Indianapolis.

Read at the Fifteenth Annual Assembly of the United States Chapter, International College of Surgeons, Cleveland, Nov. 1, 1950.

Submitted for publication Nov. 30, 1950.

When it is used, the instrument of fixation must absolutely minimize the danger of disimpaction. About eighteen years ago the senior author was distressed when he disimpacted such a fracture while inserting a flanged nail. This experience was repeated a few years ago. The nail was easily driven through the neck of the femur, but disimpaction occurred when it engaged the more compact bone of the femoral head. Later we used Granberry wires in a few cases; the wires were drilled into the bone.

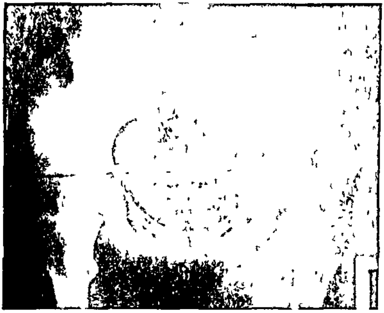

Fig. 1.—Roentgenograms of Mrs. F S. aged 49. Type I fracture; ½ inch (1.2 cm.) impaction; severe rheumatoid arthritis Treated without internal fixation with union and fair result

The greatest danger is careless handling of the patient, especially during anesthesia. Since 1937 we have used the sandbag pillow splint for Type I fractures, with gratifying results. Heavy traction is to be avoided, because impaction may be lost after relaxation of the muscle spasm. A winged plaster boot or bilateral boots joined by a crossbar may be used to prevent external rotation. Neutral or slight internal rotation must be maintained and adduction prevented. Considerable activity is allowed. A trapeze is placed over the bed. This allows the patient to raise himself for nursing care. A back rest is allowed at all times The patient is urged to take deep breathing exercises many times daily. Massage is given to the abdomen, groins, thighs and calves several times daily. Muscle-setting exercises for the affected limb are beneficial. Such a program will greatly diminish the incidence of complications. (This treatment

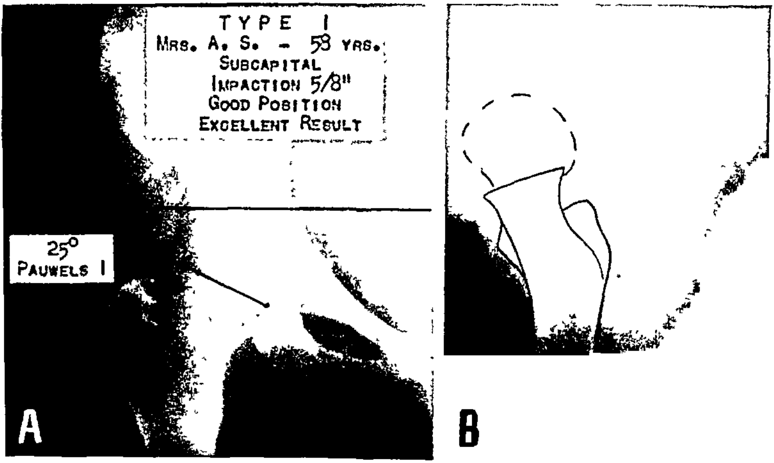

Fig. 2.—Roentgenograms of Mrs. A. S., aged 58. Type I fracture; ⅝ inch (1.6 cm.) impaction; good alignment of the fragments Treated without internal fixation. Excellent result.

should not be called watchful expectancy.) Walking with support is allowed at six weeks or so.

Type II fractures are impacted with or without abduction (valgus). They are usually fractures of the Pauwels I or III type, which involves the neck rather than the subcapital portion of the femur. The shearing stress at the fracture is conducive to disimpaction, especially during the period of absorption at the fracture line. Internal fixation may be chosen for the treatment of this fracture. Reduction is not necessary, and impaction must be maintained; therefore, we prefer an internal fixation splint which requires drilling rather than pounding for its insertion. It is true that impaction will not always be lost, especially if the nail is inserted exactly in the center of the head, but perfect insertion of a flanged nail is difficult in an abduction fracture. Loss of impaction occurs frequently enough to warrant particular care.

Type III fractures may be deeply impacted. The alignment of the head to the neck of the femur is not acceptable. Therefore, disimpaction and reduction are required. The surgeon may use whatever type of internal fixation he prefers.

In our series there were 42 women and 8 men. The average age was 62 years, excluding one 33-year-old patient. Thirty-seven fractures were classified as Type I, 4 as Type II and 2 as Type III. Seven could not be classified because the films had been destroyed or lost. Only 1 of the Type I (valgus) fractures became disimpacted and required internal fixation. One Type II fracture became disimpacted when nailed. (There was another such case, the record of which cannot be found; this case was omitted from the series.) Thirty-five Type I, 2 Type II and 1 Type III fractures united without internal fixation. Five fractures were treated by internal fixation, with union.

Complications.—Two patients, 77 and 78 years old respectively, died of direct complications. One 33-year-old patient continued to have a painful hip and died of cirrhosis of the liver twenty-three months after injury.

Nonunion occurred in 1 hip.

In 2 hips avascular necrosis developed after union. One of these hips, with a fracture of Type I, healed without internal fixation. The other, with a fracture of Type II, became disimpacted on insertion of a Smith-Peterson nail and united; avascular necrosis developed later. This patient had a ⅝ inch (2.8 cm) impaction. This group is too small to evaluate such complications as avascular necrosis and nonunion.

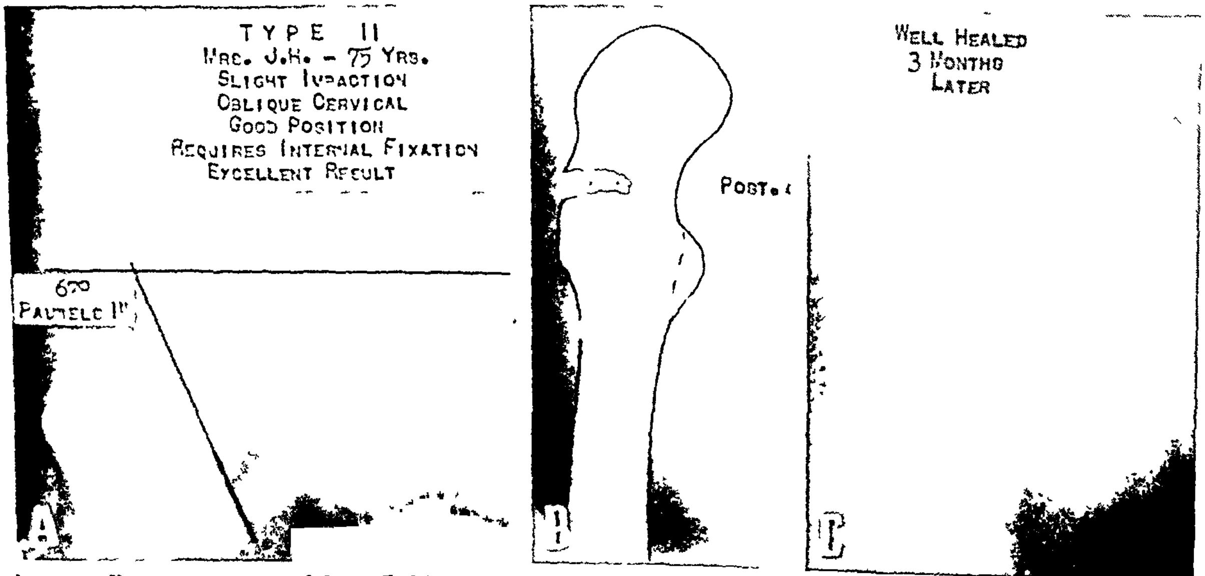

Fig. [illegible].—Roentgenograms of Mrs. J. H., aged 75. Type II fracture: impaction less than ¼ inch (0.6 cm,), but with good position. Treated without internal fixation. Excellent result.

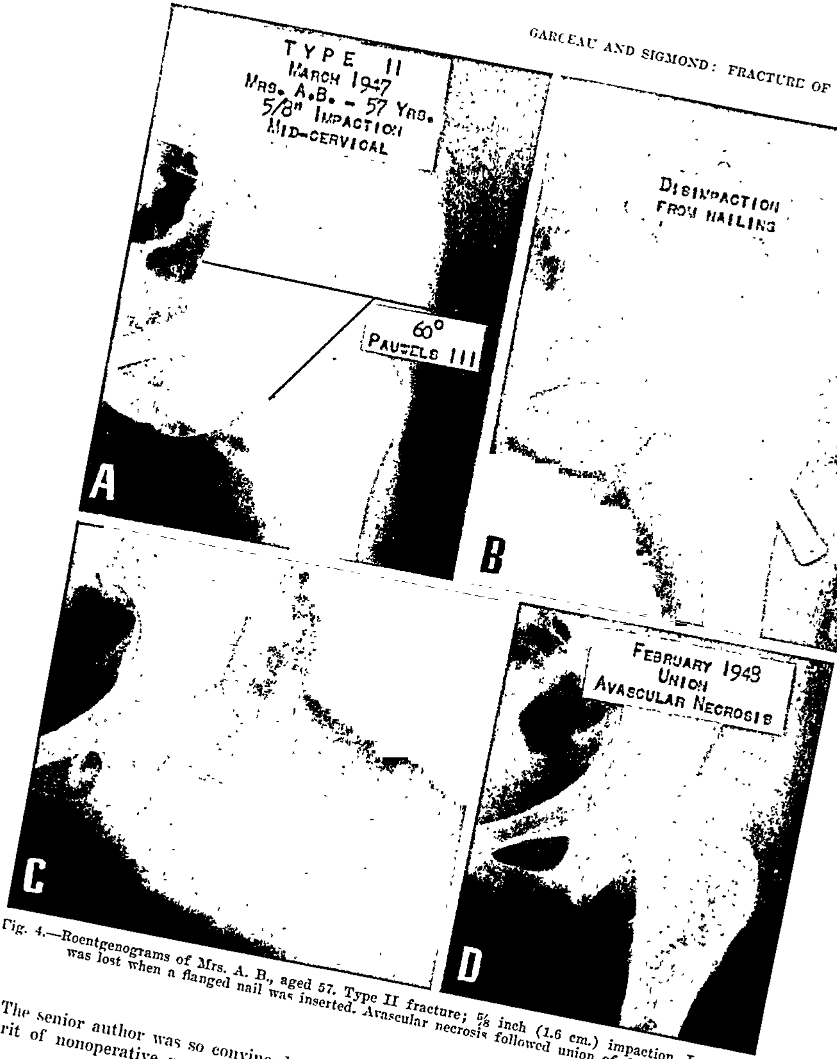

Fig. 4.—Roentgenograms of Mrs. A. B., aged 57. Type II fracture; 5/8 inch (1.6 cm.) impaction. Impaction was lost when a flanged nail was inserted. Avascular necrosis followed union of fracture.

The senior author was so convinced of the merit of nonoperative management that his own Type I fracture was treated without surgical intervention.

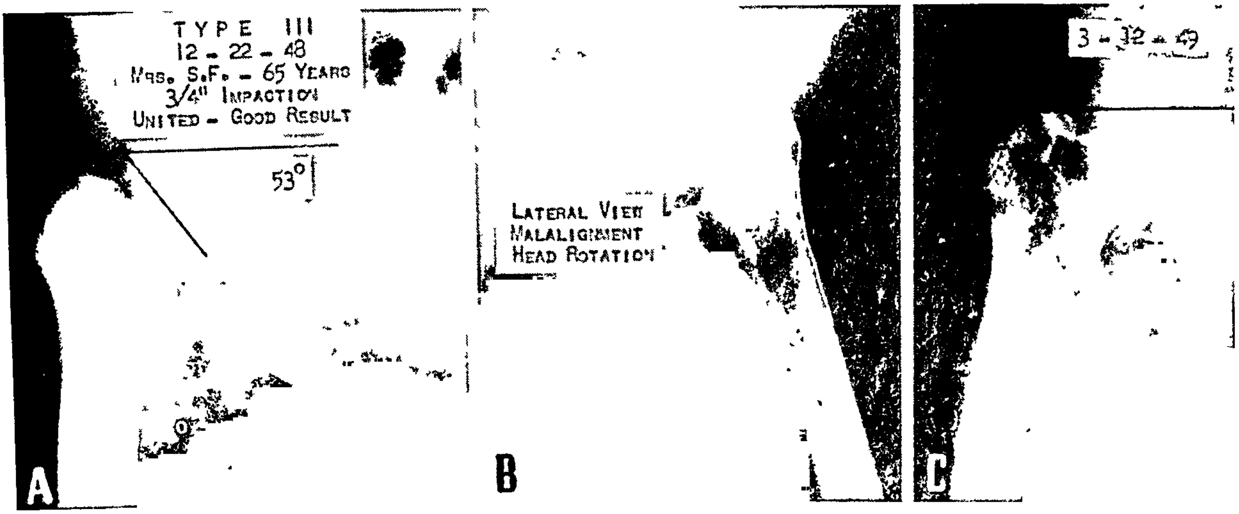

Fig. 5.—Roentgenograms of Mrs. S. F., aged 65. Type III fracture; ¾ inch (1.9 cm.) impaction. Alignment of head to neck not poor. Treated without internal fixation. Fracture united. Good result.

SUMMARY AND CONCLUSIONS

1. The well impacted subcapital abducted (valgus) fracture of the neck of the femur will do well under the most conservative nonoperative management.
2. If internal fixation is used for fractures of Types I and II, the instrument should be one which is drilled into the bone.
3. If the fracture is of such a type that reduction is required, internal fixation is necessary.
4. A classification is suggested which may be useful in selecting the method of treatment

RIASSUNTO

1 Frattura del collo femore subcapitalis ben serrato in abduzione fa bene sotto trattamente conservativo, non operativo.
2. Quando s'impiega la fissazione interna per fratture dei tipi I e II bisogna che l'istrumento sia qualunque che buca dentro l'osso
3. Per la frattura d'un tipo che domanda riduzione, fissazione interna e necessario
4 Suggerisce una classificazione vantaggiosa nella scelta del metodo di trattamento.

RÉSUMÉ

1 Une fracture subcapitale engrenée du col du femur avec abduction (valgus) peut être traitée avec succès sans opération.
2. Si la fixation interne est employée pour les fractures du type Numéro 1 et du type numéro 2, l'instrument doit être vissé dans l'os.
3. Si la fracture est de telle nature qu'une réduction est indiqué la fixation interne est nécessaire.
4. Une classification est suggérée qui peut être utile pour guider le choix de la méthode de traitement à employer.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Die fest eingekeilte subkapitale abduzierte (Valgus-) Fraktur des Oberschenkelhalses nimmt unter aeusserst konservativer nichtchirurgischer Behandlung einen guten Verlauf.
2. Wenn bei Bruechen vom Typus I und II interne Fixierung angewandt wird, so sollte ein Instument benuetzt werden, das in den Knochen hineingebohrt wird.
3. Falls es sich um einen Bruchtypus handelt, der Einrichtung erfordert, ist interne Fixierung notwendig.
4. Es wird eine Klassifizierung vorgeschlagen, die zur Auswahl der Behandlungsmethode von Nutzen sein mag.

RESUMEN

1. La fractura femoral cervical bien encajada subcapitalmente en abducción (valgus)

se beneficiará con la conducta no operatoria más conservadora

2 Taladrar el hueso con el instrumento en caso de usarse fijación interna para fracturas de tipos I y II

3 La fijación interna es necesaria si se trata de un tipo de fractura que requiera reducción

4 Se sugiere una clasificación que puede ser útil para seleccionar el método de tratamiento

REFERENCE

Pauwels, F Der Schenkelhalsbruch im Mechanisches Problem Ztschr f Orthopod Chir Hassenbergsteige, Stuttgart, 1935 (Ferdinand Enke)

Echoes of the Past

VI. The Mythical History of Cesarean Section

Although the legendary history of cesarean section quite frequently appears in nonmedical literature, it is rarely mentioned in the writings of the older medical scribes The treatises of the ancient masters in medicine, such as Hippocrates, Galen, Celsus and Aetius, contain nothing of it

Pliny, the Latin writer, says that Scipio Africanus was the first and Manlius the second of the Romans who owed their lives to the operations now called cesarean section The seventh book of Pliny states that Julius Caesar was born in this way, a legend which gave the procedure its name Some deny the validity of this belief

Ancient Roman sculpture depicts the birth of Bacchus (God of Mirth and Wine) by cesarean section from the corpse of Semele Greek mythology unfolds the birth of Bacchus in the following way After Zeus burnt the house of Semele, daughter of Cadmus, he sent Hermes in great haste with directions to take from the burned body of the mother the product of a seven months pregnancy This child was Bacchus Aesculapius, according to the legend of the Romans, had been excised by his benefactor Apollo from the womb of his dead mother, Corinis who was already on the funeral pile For this reason all products of cesarean section were regarded as sacred to Apollo Persons born in this way were thought to be endowed with sagacity and bravery

Ancient records tell us that one of the kings of Navarre was delivered in this way, as was the celebrated Doge of Venice, Andreas Doria Jane Seymour, one of the wives of King Henry VIII, was supposed to have been delivered of Edward VI by cesarean section The king, after the results of a consultation of many physicians was made known, exclaimed "Save the child by all means, I shall be able to get mothers enough!"

Robert II of Scotland was said to have been born in this way He was born by a postmortem cesarean section His mother, Margery Bruce, was killed while riding, having been thrown from her horse In Macbeth, Shakespeare places the following words in the dialogue spoken by MacDuff, "Who was from his mother's womb untimely ripped," This is another reference to cesarean section The philosophic literature of London circa 1900 relates the account of cesarean section performed by a butcher

With the advent of modern surgery and antisepsis cesarean section became an accepted therapeutic procedure in certain obstetrical difficulties Owing to improvements in technic advocated by Porro and others, cesarean section has become a frequent daily occurrence, with a minimum mortality in the hands of the trained obstetrician —*Bernard J Ficarra, M D , F I C S*

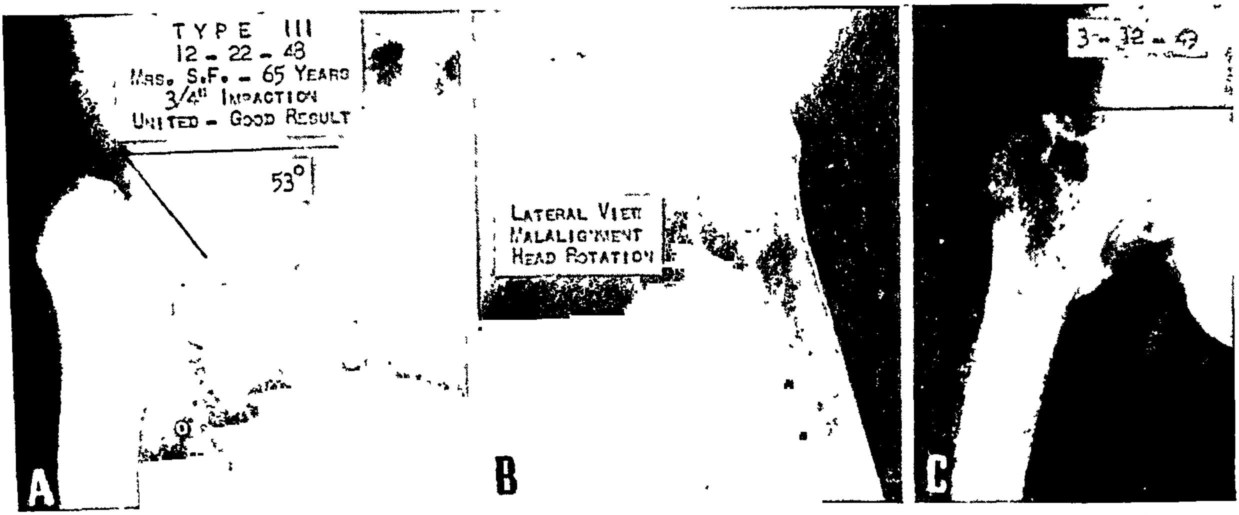

Fig. 5.—Roentgenograms of Mrs. S. F., aged 65. Type III fracture; ¾ inch (1.9 cm.) impaction. Alignment of head to neck not poor. Treated without internal fixation. Fracture united. Good result.

SUMMARY AND CONCLUSIONS

1. The well impacted subcapital abducted (valgus) fracture of the neck of the femur will do well under the most conservative nonoperative management.

2. If internal fixation is used for fractures of Types I and II, the instrument should be one which is drilled into the bone.

3. If the fracture is of such a type that reduction is required, internal fixation is necessary.

4. A classification is suggested which may be useful in selecting the method of treatment.

RIASSUNTO

1. Frattura del collo femore subcapitalis ben serrato in abduzione fa bene sotto trattamente conservativo, non operativo.

2. Quando s'impiega la fissazione interna per fratture dei tipi I e II bisogna che l'istrumento sia qualunque che buca dentro l'osso.

3. Per la frattura d'un tipo che domanda riduzione, fissazione interna e necessario.

4 Suggerisce una classificazione vantaggiosa nella scelta del metodo di trattamento.

RÉSUMÉ

1 Une fracture subcapitale engrenée du col du femur avec abduction (valgus) peut être traitée avec succès sans opération.

2. Si la fixation interne est employée pour les fractures du type Numéro 1 et du type numéro 2, l'instrument doit être vissé dans l'os.

3. Si la fracture est de telle nature qu'une réduction est indiqué la fixation interne est nécessaire.

4. Une classification est suggérée qui peut être utile pour guider le choix de la méthode de traitement à employer.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Die fest eingekeilte subkapitale abduzierte (Valgus-) Fraktur des Oberschenkelhalses nimmt unter aeusserst konservativer nichtchirurgischer Behandlung einen guten Verlauf.

2. Wenn bei Bruechen vom Typus I und II interne Fixierung angewandt wird, so sollte ein Instument benuetzt werden, das in den Knochen hineingebohrt wird.

3. Falls es sich um einen Bruchtypus handelt, der Einrichtung erfordert, ist interne Fixierung notwendig.

4. Es wird eine Klassifizierung vorgeschlagen, die zur Auswahl der Behandlungsmethode von Nutzen sein mag.

RESUMEN

1. La fractura femoral cervical bien encajada subcapitalmente en abducción (valgus)

ple rib fractures and traumatic rupture of the trachea or the esophagus

2 Blast injuries from an explosion from a compressed air hose or tire or even from a liquid under pressure

3 Closed penetrating injuries of the chest, such as bullet wounds or stab wounds from a knife an ice pick or a splinter of wood or glass

4 Open penetrating wounds of the chest in which the chest wall is torn open leaving an open sucking wound

5 A perforating foreign body in the esophagus such as a nail a sliver of glass a bone, etc

Traumatic pneumothorax from any of these sources should not be difficult to recognize when there is a history of injury to the chest and may be diagnosed by physical examination or roentgen studies or both if one will only think of the possibility of such a condition I am convinced that many patients die from unrecognized and unrelieved tension pneumothorax after trauma to the chest in automobile and other accidents who could be saved by a little thought and some very simple therapeutic measures The recognition and prompt treatment of a pneumothorax, even if it is without great tension, may be extremely important to any seriously injured patient, indeed, it may save his life If one thinks of the possibility of pneumothorax, one may easily recognize and treat it

Accidental Pneumothorax Accidental pneumothorax is a true type of traumatic pneumothorax The trauma may be trivial, it is usually secondary to some diagnostic or therapeutic procedure and occurs as an accidental complication of that particular examination or treatment It occurs commonly, far too commonly, but is recognized, or at least admitted, much less frequently It is seen in the following conditions

1 Following induced pneumothorax—probably at least 50 per cent of the time if one will search carefully for it Some advocate attempting to induce pneumothorax in this way, but the reasoning is not altogether clear

2 Following thoracentesis

3 From pericardial aspiration

4 From a pneumothorax refill

5 From attempted needle biopsy of the lung or lung puncture for diagnostic purposes

6 From intercostal sympathetic or brachial plexus block for anesthetic or therapeutic reasons

7 From needle aspiration of a pulmonary cyst or abscess

8 Following a dorsal sympathectomy operation in at least 30 per cent of cases

9 During the course of a thoracoplasty or an extrapleural pneumonolysis operation

10 Following bronchoscopic and occasionally esophagoscopic procedures

11 During a laparotomy for disease of the gallbladder or stomach when high incision is made or during operations upon the kidney or the adrenal gland when the diaphragm and pleura are inadvertently penetrated

The possibility of accidental pneumothorax must always be remembered in the case of any patient in whom dyspnea or chest tightness develops after any manipulation about the chest A collapse of this type is frequently of small degree but may go on to a tension pneumothorax with its associated dangers

Spontaneous Pneumothorax A spontaneous pneumothorax is one which occurs without any external or internal trauma The margin between this and traumatic pneumothorax may be extremely small An attempt to differentiate some from a traumatic pneumothorax may be difficult or impossible, particularly in certain medicolegal situations in which the legal term 'post hoc propter hoc" comes into the picture In many instances the trauma or alleged trauma is minimal or almost nonexistent and yet, because the collapse occurred "on the job', the resultant pneumothorax is adjudged traumatic and therefore, compensable Spontaneous pneumothorax occurs most commonly from the rupture of a peripheral emphysematous bleb into the pleural space, permitting leakage of air and collapse of the lung The resultant pneumothorax may be slight or large (or even a tension pneumothorax), it may be recurrent or chronic and with or without an associated hemopneumothorax or hydropneumothorax Secondary infection in the pleural cavity is usually rare, and empyema seldom results

A true spontaneous pneumothorax may also result from the spontaneous rupture of a tuberculous cavity or an abscess of the lung into the pleural space. This can produce a very serious situation, in which a tension pneumothorax is complicated by infection of the pleural space with tubercle bacilli and both aerobic and anaerobic secondary organisms. This is more difficult to treat and carries a much more serious prognosis than the ordinary spontaneous pneumothorax. Fortunately it is much rarer. Another variety of spontaneous pneumothorax of the most serious import is that associated with spontaneous rupture of the esophagus, which inundates the pleural cavity with food and gastric contents. This is a highly fatal condition. If it is recognized early and treated thoroughly and radically, however, some of the patients can be saved.

In the majority of cases spontaneous pneumothorax was formerly assumed to be related to pulmonary tuberculosis and treated accordingly. It is now known that only a very small percentage of spontaneous pneumothoraces, particularly those not associated with contamination of the pleural cavity, are in any way related to pulmonary tuberculosis. They are the result of the rupture of a peripheral emphysematous bleb, a condition seen very commonly in the lungs of otherwise healthy persons with no known disease of the lungs, as well as in others with asthma, bronchiectasis, and a variety of other pulmonary conditions. These blebs are as delicate as cobweb and may rupture from the very slightest trauma, such as a sneeze, a cough, a sudden movement, bending over to pick up some object or to lace the shoes, straining at stool, lifting some object of medium size, a hug, a slight blow on the chest, a slip or slight fall or some other relatively minor activity. The ruptured bleb leaks air; the lung collapses until a balance is brought about between the pressures in the pleural cavity and the pressures in the peripheral portion of the lung. Leakage then ceases, permitting the opening to seal by rapid growth of the pleural cells. If no further tear occurs, the trapped air will slowly absorb and the lung expand.

If the ruptured bleb is large there may be a defect which is too broad for the pleural cells to bridge; the opening remains patent and leakage continues indefinitely, or healing may be insecure, with recurrent rupture of the bleb producing a chronic spontaneous pneumothorax in which the lung either partially expands and then goes down again or remains collapsed for a long period. The rupture of a tuberculous cavity or a nontuberculous abscess into the pleural space, producing a pneumothorax, usually results in the prompt development of empyema, either tuberculous or with mixed infection present, and frequently in the development of putrid empyema. It is an extremely serious complication and demands radical measures promptly established if the patient is to be saved. Spontaneous rupture of the esophagus into the pleural cavity likewise constitutes an emergency of most drastic proportions, yet some of the patients may be saved by prompt recognition and prompt and radical surgical treatment.

Hemopneumothorax: Hemopneumothorax, that is, pneumothorax complicated by an accumulation of blood in the pleural cavity, may occur under the following circumstances, and hemothorax (bleeding into the pleural cavity without the presence of air) may occur in most of them:

1. Crushing injuries of the chest with or without fracture of ribs, tearing of the lung or rupture of one of the large vessels or heart chambers.
2. Penetrating injuries from stab wounds, bullet wounds or fragments of other material. Occasionally a hemothorax or hemopneumothorax follows a simple needle puncture of the chest wall. A simple rib fracture also may result in hemothorax or hemopneumothorax, particularly if fragments of the rib are driven inward by a fall against a projecting object. The bleeding may occur from an intercostal vessel, an internal mammary vessel, the azygos vein, one of the large vessels at the hilum or the parenchyma of the lung itself.
3. Spontaneous pneumothorax.

Any rapidly accumulating fluid formation within the chest following trauma must be considered as blood except in case of spontaneous perforation of the esophagus, when it is usually stomach contents. Rapidly accumulating blood within the pleural cavity calls for prompt transfusion and supportive measures and prompt surgical intervention to control the bleeding. If the bleeding occurs slowly, supportive measures are indicated with the hope that bleeding will be self limited Early aspiration is not to be recommended except to relieve tension The fluid should be removed from the pleural cavity after forty eight to seventy two hours in order to prevent clotted hemothorax and entrapment of the collapsed lung

Tension Pneumothorax Tension pneumothorax is any pneumothorax in which the pressures within the pleural cavity are built up to such a point as to affect the patient adversely This does not always occur at the same degree of pressure Symptoms may result from collapse of the lung with loss of breathing space from displacement of the mediastinum or from excessive pressure brought to bear on the thin walled veins at the base of the heart The possibility of tension pneumothorax must always be borne in mind and a careful watch kept for the development of tension Attention must also be called to the fact that any pneumothorax pocket may become a tension pocket from expansion of the air with increasing altitude in cross country or air travel Excess pressure must be relieved promptly but everyone concerned must realize that usually when the tension is relieved it tends to recur, and provision must be made for its subsequent relief either by repeated aspiration or by the connection of an indwelling cannula or catheter to a water breakover or a continuous suction apparatus No elaborate apparatus is needed in an emergency to relieve a tension pneumothorax An 18 gauge needle alone, without syringe or tubing attached, will permit air to escape and decompress a tension pocket temporarily until a more suitable arrangement can be provided Persistent leakage may call for a thoracotomy and surgical repair of the leaking area

Treatment—Many pneumothoraces cause little trouble produce no symptoms and may absorb and disappear spontaneously If there seems to be no tendency for the pneumothorax pocket to refill the air may be permitted to absorb, which it does slowly, for two to several weeks depending upon the size of the pocket and the normality of the pleural surface After the leaking point has become sealed, the expansion of the collapsed lung may be facilitated by aspiration of air from the pleural space This is probably better carried out in several stages to avoid excessively high negative pressures which might reinduce leakage Complete aspiration is not necessary, and great care must be exercised in attempting to remove the latter part of the pneumothorax pocket, because of the danger that the needle may puncture the lung, thereby inducing an additional accidental pneumothorax Occasionally a single aspiration is all that is necessary in order to start absorption of air and bring about expansion of a lung which has remained down for some time

The use of an "under water" breakover connected to an indwelling cannula or catheter is of value with tension pneumothorax and may prove a simple answer to the situation until the leakage ceases The use of continuous suction with controlled pressures may be necessary if leakage persists, just enough suction volume being utilized to keep ahead of the leak and with avoidance of the creation of excessively high negative intrapleural pressures which may reinduce leakage Open operation with excision of leaking blebs or suture of the lacerated lung may be necessary if the refilling of a pneumothorax is of dangerous proportions or if the lung does not tend to seal off and control the leakage spontaneously It may be necessary for chronic spontaneous pneumothorax when the lung has remained collapsed for a considerable time, not only to excise the leaking blebs but to decorticate the lung which has remained in collapsed position and become bound down by a deposit of fibrin on its surface

Cyanosis and Dyspnea of the Newborn—The presence of cyanosis and dyspnea in a newborn child presents a true emergency situation It may be due to any of a variety of conditions listed as follows

1 The presence of mucus or other secretions in the bronchial tree

2 Improper expansion of the lung—"atelectasis"

3 Congenital deformities of the heart and great vessels

4 Diaphragmatic hernia

5 Pulmonary cysts or blebs

6 Traumatic pneumothorax due either to birth trauma or to the efforts of the attending physicians and nurses to induce respiration

7. Agenesis of the lung.
8. Empyema of the newborn.

When a newborn baby does not breathe well or cannot maintain its color, the first thought should be that the difficulty may be due to the presence of mucus or other secretions in the tracheobronchial tree; hence, the first effort should be to hold the child in an inverted position to favor gravity drainage of such secretions. This should be followed by catheter aspiration of the pharynx and the upper part of the respiratory tract and perhaps soon by aspiration of the lower part of the tract. The use of oxygen and the respirator is fine as a temporary measure, but it may be fatal to assume that mucus has been the sole cause of the difficulty. To spend a great deal of time attempting to aspirate the respiratory tract when the difficulty is due to something else may deprive the child of all possible chance of recovery. As soon as possible, even while the child is being given oxygen and artificial respiration, a roentgen film of the chest should be made, for detelectasis, some congenital deformities, diaphragmatic hernia, pulmonary cyst or blebs, traumatic pneumothorax, maldevelopment of the lung, empyema of the newborn and intrathoracic tumors may all be demonstrated by a single roentgenogram and the true nature of the difficulty easily determined.

It is particularly important in cases of diaphragmatic hernia to discover the condition at once, before the child is given any water or a feeding of any type. Many of these children do well until they begin to swallow air, which distends the trapped stomach and bowel, inducing tension within the chest, displacing the heart and mediastinum and compressing the contralateral lung until death ensues. Prompt recognition and early surgical intervention may save the child. The same applies to traumatic pneumothorax and empyema of the newborn, in both of which aspiration of air or pus promptly relieves the mechanical situation.

Another point which is usually overlooked with patients who require some artificial respiration and oxygen administration is the fact that to leave the lungs inflated with pure or nearly pure oxygen may invite a recurrence of respiratory difficulties very soon after its use is discontinued. The oxygen absorbs rapidly from the alveoli, which may then promptly return to an unexpanded condition, with recurrence of cyanosis. When the high oxygen mixture used in the respirator is discontinued, the child should be carried for a time on air, so that the lungs are well inflated with a mixture which is not absorbed as rapidly as oxygen and which may prevent their subsequent collapse.

Tension Cysts and Bullae of the Lung.—The scope of this paper does not permit a detailed consideration of pulmonary cysts, either congenital or acquired. The cysts with which one is concerned from the emergency standpoint are those which through a check-valve mechanism undergo progressive distention to a point at which the patient becomes embarrassed by the mass of the cyst or bleb itself. This may occur with either the congenital or the acquired bullous cysts but is particularly prone to occur in the latter, which are usually multiple and not infrequently bilateral. As the blebs increase in size they compress adjacent lung tissue, giving rise to increasing dyspnea, and at times produce a condition known as the vanishing lung. Needle aspiration of ballooning cysts is not to be recommended except as an emergency procedure immediately before surgical exploration, as this decompression of the cyst is not permanent. It tends to refill rapidly; the pleural cavity is usually not obliterated, and a needle puncture wound merely creates a leak between the cyst and the pleural cavity with secondary development of a tension pneumothorax. Catheter drainage with continous suction after fixation of the cyst wall to the chest wall is advocated by Head to bring about marked reduction in the size of the bullae and consequent reexpansion of adjacent lung tissues. It is as yet undetermined how lasting the results of this treatment may be or how soon the blebs tend to refill, with secondary ballooning. In certain selected situations ballooning is confined to a localized area of the lung with compression of adjacent lung tissue; under such circumstances, open thoracotomy with resection of the ballooning area may be followed by marked relief and rapid increase in vital capacity. It is almost never possible to excise all of the involved areas of the lung, so it is logical to expect that in the long run additional ballooning will occur Temporary relief however, may be important, and some may improve for a considerable period

Subcutaneous and Mediastinal Emphysema—Subcutaneous emphysema from the patient's standpoint may be a very painful and alarming condition, but from the medical standpoint aside from the pain produced, it is not particularly serious Even when the degree of subcutaneous air infiltration is sufficient to obliterate the features and to extend over wide areas of the body it does not seriously jeopardize the patient's life Subcutaneous emphysema results from

1 Traumatic injuries of the chest both the crushing and the closed penetrating type

2 Rib fractures with or without an associated pneumothorax

3 Tension pneumothorax, particularly one which has been aspirated

4 Traumatic perforation of the esophagus

5 Traumatic rupture of the bronchus

6 Spontaneous rupture of the esophagus

The seriousness of the lesion is directly related to the seriousness of its exciting cause the emphysema being largely a painful and disturbing symptom One must always be certain of course, that the gas in the tissues is not from an anaerobic gas forming infection which of course, is a much more serious condition Treatment must be directed at the cause of the leakage in order to prevent continued loss of air into the tissues This may involve continuous drainage of a tension pneumothorax pocket or surgical attack upon a ruptured esophagus or bronchus

Mediastinal emphysema, on the other hand may be an extremely serious condition and may result from any of the six conditions mentioned above It becomes serious because of the pressure exterted by the gas under tension in the loose tissues of the mediastinum compressing the thin walled veins and even the trachea to a serious degree Treatment must be directed at eliminating the source of the leakage if possible and by surgical decompression of the mediastinum in the super sternal notch, permitting escape of the air and relief of the pressure upon the mediastinal structures The migration of air through the loose areolar tissue may carry infection with it and produce serious mediastinitis

Atelectasis—Atelectasis from bronchial obstruction more or less acute is of such common occurrence that it must be considered and handled frequently The more chronic types of pulmonary collapse due to bronchial stricture and bronchial tumor both benign and malignant are beyond the scope of this discussion Atelectasis resulting from bronchial obstruction from mucous secretion occurs commonly in both medical and surgical practice It is observed under the following circumstances

1 In the postoperative period

2 Following a chest injury

3 Following pulmonary hemorrhage

4 In the presence of bronchial asthma

5 In any unconscious state—head injuries diabetic coma alcoholic intoxication morphine or barbital poisoning epilepsy and brain tumors

6 Following aspiration of a foreign body

The mucus producing the obstruction may originate in the lung but not infrequently is aspirated from the nose the pharynx or the stomach

The clinical picture of atelectasis is rather easily recognized in the postoperative state when one can almost wager that any sharp rise in pulse or temperature occurring within forty eight to seventy two hours after operation is the result of atelectasis rather than of pneumonia or a wound infection If at the same time the patient manifests some dyspnea, there is probably little doubt about the nature of the situation The incidence of this complication may be materially reduced postoperatively by frequent change of position and by requiring the patient to breathe deeply to cough voluntarily to take hot drinks or inhale steam if possible, and at the same time seeing to it that the patient's fluid balance is adequate and that, if oxygen is used, adequate humidification is supplied at the same time The avoidance of the execessive use of morphine, codeine and atropine will also reduce the incidence of such trouble Postoperative bronchoscopic aspiration of secretions before the patient leaves the operating room is likewise important Control of pain, permitting cough w[illegible] less difficulty, will also prevent the [illegible] this co[illegible]

When atelectasis has developed, it may frequently be readily relieved by encouraging the patient to cough. If the operation has not involved the thorax the patient may be turned upon the uninvolved side and requested to take several deep breaths; then, with the chest held in full inspiration, heavy hammer percussion with the fist over the involved area may dislodge the mucus promptly and give almost immediate relief. The knee-chest position may also help the patient to cough and raise the offending mucus. The patient who does not wish to cough may be induced to do so by the inhalation of some irritating substance.

The use of intratracheal suction catheters may also be of great help. If relief cannot be obtained oherwise, bronchoscopic aspiration may be necessary. Very frequently in this situation, however, the bronchoscopist really does not aspirate the mucus obstruction, but merely provides the irritating factor which induces cough enough to dislodge the mucus. Stabilization of the chest wall in chest injuries and after thoracic operations may prevent the development of this situation or be an aid in its relief. The passage of nasal suction catheters through the nose to the trachea without any anesthesia may frequently accomplish the desired result in the unconscious patient. If results are not being obtained or if bronchoscopic procedures must be carried out at too frequent intervals, a tracheotomy should be done to permit frequent aspiration of the respiratory tree and may be life-saving. For shorter periods, an indwelling intratracheal tube may accomplish the same purpose. Atelectasis must be relieved or permanent damage to the lung may follow.

These situations are not mysterious. They may be recognized readily if one will but think of them and remember the mechanical forces involved. The majority may be treated early and effectively if one will but approach them on this simple basis.

SUMMARY

The author discusses and explains the various types of pneumothorax, cyanosis and dyspnea of the newborn, tension cysts and bullae of the lung, subcutaneous and mediastinal emphysema, and atelectasis, with suggestions for the management of each. He advocates awareness on the part of the clinicism of the mechanical forces involved, and expresses the opinion that this will lead to early, simple and effective treatment.

RÉSUMÉ

L'auteur discute et explique les différents types de pneumothorax; la cyanose et la dyspnée du nouveau-né. les kystes du poumon, l'emphyséme sub-cutanné et mediatestinale, l'ateclatase et donne des suggestions pour le traitement de chacune de ces affections. Le clinicien doit être au courant des conditions mécaniques engagées. L'auteur exprime l'opinion que l'étude des méthodes ordonne un traitement précoce, simple et effectif.

RIASSUNTO

L'A. discute e spiega i diversi tipi di pneumotorace; cianosi e dispnea del neonato; cisti a tensione, vesciche del polmone; enfisema sottocutaneo e mediastinale e atelettasia colla suggestione del dirigmento. Difende attento costantemente sulla parte del clinico alle forza meccaniche cagionate, indicando l'opinione che tale vigilanza condurrera' al trattamento precoce semplice ed effettivo.

ZUSAMMENFASSUNG

Verfasser eroertert und erklaert die verschiedenen Formen des Pneumothorax, die Zyanose und Kurzatmigkeit des Neugeborenen, Spannungszysten und Blasenbildungen in der Lunge, subkutanes und mediastinales Emphysem und Atelektase und macht Vorschlaege fuer die Behandlung dieser Erkrankungen. Er setzt sich dafuer ein, dass der Kliniker mit den in solchen Zustaenden wirksamen mechanischen Kraeften vertraut sein sollte und vertritt die Meinung, dass durch solche Kenntnisse eine fruehzeitige, einfache und wirksame Behandlung gewaehrleistet wird.

Thermal and Fluid Therapy of Atomic Bombing Injuries*

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TWO therapeutic measures for atomic bomb injuries, namely temperature control and the use of salt solution, have either been totally ignored in official and unofficial advices or have received such inadequate mention that their value is not generally understood. In covering this large deficit, space permits only illustrative examples from the literature, which can be verified as typical of a fuller bibliography. Also it should be made clear at the outset that the value mentioned is not theoretical but practical. In a crisis of widespread destruction when speed of treatment is decisive in saving many lives, these measures can be effective when facilities for other treatments are lacking.

I. TEMPERATURE

Outside the central zone of total annihilation, any areas sufficiently populated to be worth bombing will have numerous refrigeration installations and some stocks of actual ice, often located underground. Cold water also can serve some purposes. There is the further possibility of bombing in winter weather. The practical means being available, one may consider the usefulness of reduced temperature for the three classes of atomic casualties, namely irradiation injury, mechanical trauma and thermal burns.

A. Irradiation Injury.—A single authoritative reference will suffice for including refrigeration as part of the routine care of radiation lesions. Knowlton and his associates[1] have stated concerning beta ray burns: "The initial treatment consisted of immobilization, elevation and cooling of the involved hands with ice packs." Also, "Local treatment consisted of routine burn therapy with accessory chilling and later surgical debridement and skin grafting."

B. Mechanical Trauma.—Concussion, falling walls and flying debris will cause every conceivable kind of traumatic injury. Cold is unique in inhibiting simultaneously pain, exudation, thrombosis, shock, infection, toxic absorption and tissue devitalization.

Hemorrhage. A wound of a large blood vessel will often require a tourniquet. Even if it is released at frequent intervals according to current first aid instructions, cold will still reduce tissue damage, but more important is the saving of both blood and tissue by leaving the tourniquet undisturbed, in accordance with both experimental and clinical proofs of preservation of bloodless refrigerated limbs for hours or days.[2] Rarely, if an abdominal tourniquet should be the only means of checking hemorrhage from great vessels anywhere below it, animal experiments indicate that the procedure may be feasible with refrigeration.[3]

Crush Injuries. These provide a typical field for the aforementioned benefits of cold, which was established as part of the routine treatment in England during the Second World War.

Amputations. Since refrigeration is the only anesthesia that abolishes not only pain but shock, it has been commonly employed for poor risk operations on debilitated patients. In ordinary practice most surgeons still follow the questionable rule that if a patient can stand shock without dying he may properly be subjected to it; therefore other kinds of anesthesia are chosen to suit the convenience of the surgeon and his staff. In an atomic bombing many of the patients will be so weakened by other injuries that any necessary amputation will be critical. Therefore the shockless refrigeration method will be especially important.

Brief Postponement of Operation. If a tourniquet has been placed on a limb, either for hemorrhage or in preparation for operation, the time limit of safety at ice temperature is considerable, as has been mentioned. Refrigeration without a tourniquet is illustrated by McElvenny's well known case[4] of amputation of both legs by a railway train. The pain, which resisted opiates, was controlled by packing the stumps in ice. The profound shock was treated, so that the amputations could be surgically completed fifty-eight hours later, the tissues then being as firm and odorless as at the beginning. There are other similar reports.[5]

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Longer Postponement of Operation: Simple refrigeration without a tourniquet can check gangrene and toxic absorption until operative conditions are propitious. Classic illustrations are Mock's cases[6] of crushed pelvis with thrombosis of the iliac or femoral arteries, presenting a dilemma of immediate amputation and death from shock, or death from gangrene without operation. The legs were packed in ice for two or two and a half weeks, allowing time for treatment of other injuries and recovery of strength before the final successful amputation. The most prolonged preservation of this kind was recorded by Ottaway and Foote,[7] in the case of a seaman on a destroyer whose femoral artery and vein were severed 6 cm. below Poupart's ligament by a shell fragment. By refrigeration of the leg in an improvised air chamber at 2 C. the patient was kept well and comfortable for a month, until he could be transferred for amputation and final recovery. It is noteworthy that these various delayed amputations could be performed slightly above the knee, instead of at the higher levels which are the rule in immediate amputations. This is evidence of the development of collateral circulation in the refrigerated limbs, not prevented by vasoconstriction or tissue damage as some writers have feared.

Infection or Intoxication: Since our first experience with infected arteriosclerotic gangrene, most surgeons have become familiar with the quick control of fever and intoxication by packing the limb in ice. After an atomic explosion, treatment may be needed for secondary infection of neglected wounds or for dangerous primary infections, including gas gangrene.[8] Besides the ordinary inhibition of bacterial growth and activity by cold, the higher oxygenation signalized by the bright color of tissues and exudates must be inimical to anaerobic organisms. The fear of oxygen starvation of tissues because of inadequate dissociation of oxyhemoglobin at low temperature is unfounded, because the increased solubility of oxygen in plasma may alone suffice for the small need.[9] If a limb must definitely be sacrificed, a tourniquet with ice can be equivalent to an amputation, until surgical intervention becomes feasible.

Thrombosis and Embolism: One group consists of incomplete occlusions, or occlusion of small arteries in distal parts, typified by Bowers' cases[10] of threatened gangrene from fractures below the knee in military training. In these cases a partial blood supply persists, which is inadequate for immediate maintenance of tissue life but may be reinforced by collateral circulation if time can be allowed for its development. Here radical refrigeration reduces tissue needs to a minimum for one to several days, after which the temperature is gradually raised according to tissue color and other indications.

A second group is typified by complete occlusion of a main artery in the thigh. In old cases, in which amputation is necessary but is temporarily prevented by refusal, shock, or cardiac or general weakness, gangrene and intoxication have been held in abeyance for as long as three weeks by continuous ice packs. Theoretically, the ideal use of refrigeration is in early cases, "to extend the time limits and improve the results of embolectomy." Cold reduces the pain and shock of embolism, but its preeminent service is to preserve tissue vitality and check further thrombosis by retarding the enzymic process of clotting, preserving the smooth endothelial lining of vessels and preventing adhesion of thrombi. Though anticoagulant drugs are properly used at the same time, they act only against thrombosis and lack the power of cold to check degeneration of tissues. The embolus or thrombus acts as a partial tourniquet and thus facilitates the desired deep chilling; therefore simple ice packs may suffice. But the theoretical reasons for adding a tight tourniquet proximal to the point of occlusion are as follows: Such a tourniquet sets an absolute bar to upward propagation of the thrombus. It also stops collateral circulation, which is inadequate to preserve the tissues and merely carries in harmful warmth and blood for further clotting With the tourniquet deep chilling is more rapid and thorough, and the limb is anesthetized and ready for operation By early use of this method, before degenerative changes have occurred, the time limit for successful embolectomy may be measured in days rather than hours Also the chance of thromboses in more distal arteries is diminished partly by the better preservation of tissues before embolectomy and partly by continuance of moderate cooling for a day or two afterward

Reconstructive, Plastic and Orthopedic Operations—The basic principle is that the preservative effect of cold may enable the saving of parts which would otherwise be lost The simplest examples are cases in which fingers have been accidentally amputated to the extent that they are left hanging only by a shred of skin[11] The reduction of local metabolism at ice temperature is such that the trivial supply of oxygen and nutrition through the small skin bridge suffices to keep tissues alive for several days The severed parts when sutured, become adherent even at the near freezing temperature, so that it is possible after three or four days to begin gradually raising the temperature until it is restored to normal within a week

There has been no clinical imitation of the experiment of Blakemore and associates,[12] in which a dog's amputated leg was kept twenty four hours in an ice box and then sutured back in place Of greater immediate promise are cases in which the principal limb vessels are destroyed but tissue bridges remain There is reasonable and practical hope that such bridges may supply the minimal nutritive needs of the refrigerated distal parts for a number of hours or days, until there is opportunity to restore circulation by modern vascular surgical procedures

Reconstructive operations were most dramatically illustrated by Nachlas,[13] when hands shredded by blast injuries were not promptly amputated but instead were packed in ice for two or two and a half weeks while shock and abdominal injuries were treated The mangled tissues then appeared as fresh as on the day of the accident, and it proved possible to repair fractures and lacerations so as to restore practically normal hand function Nachlas emphasized the saving from "the horrors of no prehensile limb "

The cold storage of tissue grafts is familiar and is outside the present subject, except for passing reference to the preservation at temperatures as low as that of solid carbon dioxide, which would quickly destroy these same tissues in their natural location in the body[14] Also Mock[15] demonstrated that simple chilling with ice or an ice bag for a couple of hours furnishes sufficient superficial anesthesia for removal of skin grafts Only a few operators have adopted the rational plan of moderate cooling of operated areas for a day or two when the viability of poorly nourished structures may need support

Mention has previously been made of the value of refrigeration anesthesia for orthopedic operations with or without a tourniquet[28] More moderate cooling may be continued postoperatively to control pain and swelling The largest series of such cases was reported by Schaubel,[16] who showed also that cooling is feasible through casts

The numerous and varied examples of the saving of tissues from necrosis have not only practical but also theoretical importance as the most decisive disproof of loose allegations that tissues are gravely injured by refrigeration

Miscellaneous Uses Frostbite and immersion foot have connections with the present discussion only if atomic bombing should occur in winter, so that many well or wounded persons might suffer from exposure The value of treatment by moderate reduction of local temperature has been demonstrated clinically[17] and experimentally[18] The method does not differ greatly from the treatment of burns, but the moderate cooling must often be continued for a month or longer Another use which can be required only fortuitously is the checking of toxic absorption from the skin or any peripheral parts Examples mentioned elsewhere have been the retarded absorption of injected penicillin, etc, and the control of pain and toxic absorption in venomous bites and stings More directly conn[illegible] with [illegible] is Yudin's demonstration[19] [illegible] nanti[illegible] of mustard gas [illegible] of bits, local refrigeration can inhibit absorption to such an extent as to save the lives of the animals.

C. Thermal Burns.—Burns are an important class of injuries even in peace; in mechanized warfare they are calculated to furnish a particularly high percentage of total casualties in atomic bombing. They can occur directly as flash burns from the far-spreading heat of the explosion, or secondarily from burning clothing or buildings. They preeminently require the unique specific properties of cold, namely, the simultaneous control of pain, shock, infection and tissue devitalization.

Details of the treatment must be adjusted according to the area and depth of the burn, but a more general division can be made between fresh and old burns. A fresh burn should be refrigerated as instantly and radically as possible, preferably with crushed ice applied over thin gauze, but cold water can serve if nothing better is obtainable. The first experience will show that pain is thus abolished more quickly and thoroughly than with any of the usual dressings or drugs. Further experience will prove that the subsequent course is remarkably mitigated as regards inflammatory reaction, shock, infection and necrosis. The duration of radical refrigeration varies with the severity, from perhaps an hour for a first degree burn to a day or two for the deepest burns. The skin temperature is then gradually raised, following the rule that it should be kept as high as feasible but as low as necessary. Healing is obviously faster with the more active metabolism at normal temperature, but any return of either pain or fever is a signal for further cooling. Therefore severe cases may require more or less subnormal surface temperatures for days or weeks.

The simplicity and efficiency of the method commend it under all conditions, but especially in the exigencies of a catastrophe. Without any cleansing, scrubbing, antisepsis or debridement, a single layer of gauze is applied and covered with ice, or as an emergency substitute the undressed area may be merely kept in cold water First aid instructions should teach the general public to do these things for themselves, and in peace time similar instructions should be posted in factories where burns are frequent, because the quickest treatment is best both for comfort and for later results. Dirt comes away automatically with the daily changes of dressings, which are painless. Infection is suppressed by the low temperature so that meticulous asepsis is unnecessary. The benefits of sleep and food are obtained without the disturbance of either pain or narcotic drugs. Avoidance of the injury of mechanical or chemical cleansing, together with the maximal preservation of damaged tissues, results in less necrosis and less need of skin grafting than with any other treatment.

If the patient arrives for treatment not with a fresh burn but after delay of one to several days, various degrees of shock and infection are associated. These respond as mentioned under those topics. The local refrigeration is as radical as possible, until after one to several days the symptoms permit gradual raising of the temperature.

All burns are superficial enough to be amenable to surface cooling, so that this treatment can be used not only for the limbs but for all regions of the body. The size of the burned area imposes some limitations upon the degree of cold, because of the problem of maintaining body temperature if a very large area is radically chilled. The following details of technic may be noted: 1. For nearly all the conditions mentioned heretofore ice bags are satisfactory, the degree of cooling being regulated by the thickness of the covering or its absence. The only disadvantages are the labor of changing them and the fluctuations of temperature unless this is closely watched. In emergencies burns can be thus treated with ice, ice bags or cold water, as stated, but results are much better with special apparatus, such as Therm-O-Rite electrical refrigeration. The reasons are the frequently long duration of treatment, the nursing work, the weight of ice bags and the difficulty of keeping them properly placed, all of which are obviated by the light-weight applicators kept automatically at a selected temperature. 2. For extensive body burns, the continuous bath at a mild temperature[20] has been used more in Europe than in this country, and may be most useful for relieving pressure and regulating body temperature. 3. Cold all can be adapted to the treatment of either localized or extensive burns

Illustrative Observations 1 There is experimental evidence of the benefit of reduced temperature for preserving both local tissues and life[18] 2 Clinical experiences are confirmatory[21] 3 Most impressive are (*a*) a case of recovery from a dangerously infected burn of a leg after eleven weeks of hypothermic treatment,[22] and (*b*) recovery from a burn of more than 50 per cent of the body surface with treatment in a refrigerated room[23] Obviously refrigeration can be combined with other treatments, as desired

All these and other available facts justify criticism[24] of the common omission of any mention of hypothermia in review articles such as that of Freeman[25] on arterial injuries and that of Evans[26] on thermal burns from atomic explosions

II SALT SOLUTION

Salt solution will be discussed with reference to two principal uses namely for shock and for hemorrhage

A *Shock* —Shock must result frequently from the mechanical, thermal and other injuries of atomic bombing Rational therapy must be directed to the etiologic factors After the long controversy between upholders of the chemical (toxic) and physical (fluid shift) theories, I was the first[27] to recognize the fact that both these processes are concerned in shock, their relative proportions accounting for differences in the clinical picture and course The discussion of treatment must overlap the preceding topic, since it includes adjustment of temperature as well as fluid Before and during the Second World War three innovations were introduced in the treatment, namely (*a*) temperature reduction (Allen[28], Fay[29]), (*b*) local compression of the injured region (Patey and Robertson[30] in England), and (*c*) administration of salt solution (Allen[27])

(*a*) Reduction of temperature was a direct reversal of the prevailing practice of warming for shock Owing to the anachronistic instructions of the official Committee,[31] this harmful use of warmth was continued in the American armies during the war, with a few individual exceptions

This lowering of temperature is the only known means of combating the toxic factor in shock It diminishes the formation and absorption of tissue toxins, and also, by reducing metabolism, it reduces oxygen consumption and the consequent anoxia These effects are evident in the practically complete prevention of shock by radical local refrigeration Though the curative effect, after injury has occurred is by no means equal to the prophylactic effect, its value has been fully confirmed[32] and is no longer disputed Nevertheless there is little practical utilization of this knowledge and the weight of tradition and authority still extensively perpetuates the harmful use of warmth

(*b*) When the conditions are suitable, the repression of local exudation by compressive dressings may be beneficial or even life saving This English proposal has been confirmed by American investigators and has come into general clinical use Nevertheless it is an equally unquestioned physiologic fact that pressure injures tissues, all the more dangerously if they are already partially anemic or devitalized Also the warmth of such dressings, especially in the presence of exudation and low tissue vitality, serves to incubate bacteria, not all of which are controllable by antibiotics Various degrees of temperature reduction, according to individual indications, reinforce the benefits of compression and help further by checking pain infection and tissue devitalization

(*c*) Saline replacement of lost fluid dates back to O'Shaughnessy's treatment of Asiatic cholera in 1831, a disease which typically causes shock through desiccation The benefits of salt solution were increasingly appreciated by surgeons, and the value in burns was illustrated by Davidson[33] and Underhill[34] But the international Shock Committee in the First World War turned progress backward by an unfounded misapplication of Starling's studies of the binding of water by plasma proteins The official and academic authority of this Committee established the doctrine that "crystalloids" (a term jumbling together salts and sugars) are not only useless because their solutions pass quickly out of the circulation, but are actually harmful because the escaping fluid carries some of the precious proteins out of the blood stream My contradiction of this doctrine (1939-1941) may be claimed as a turning point according to the easily verifiable fact that up to that time every scientific writer and every textbook, without exception, repeated this dogma of the specific virtue of colloids and the uselessness and harmfulness of salt solution for shock, and since that time not a single investigator has made such a claim. The official Surgery and Shock Committees in the Second World War were anachronistic in this matter, just as in the matter of temperature, and there can be no estimation of the many lives lost by the instruction to use plasma alone and avoid saline solution for shock.[31] Several investigators have attempted a partial salvage of the old dogma by claiming greater benefits with plasma or various colloid solutions than with salt solution in cases of experimental shock. But the Mylon-Winternitz group[35] showed that dialyzed plasma and other colloid solutions are entirely valueless in the presence of shock. Rosenthal[36] confirmed the equal values of serum and saline, and added the observation that the two have equal effect whether given by vein or by stomach. These experiments were limited to mice and could not be conclusive clinically, owing to the important differences which I have pointed out elsewhere[37] between small rodents and man. But others found ample corroboration by others[38] in larger animals, and Fox[39] confirmed in burned patients both the benefit of salt solution and the feasibility of giving it in large measure orally. The same authoritative group who had prohibited the use of salt solution during the war reversed their position after the German surrender, by recommending predominantly large volumes of salt solution for burn shock.[40] The lingering attempt to ascribe special virtue to a small addition of plasma in this treatment is negated by the proofs of the identical effects of plasma and saline,[38] strictly confirming my results.

My ranking of salt solution actually above plasma can be readily substantiated in an atomic emergency. Besides the experimental fact of greater restorative value in terminal stages in shocked dogs,[27a] there are the practical advantages of immediate and unlimited availability and the usefulness orally as well as intravenously. Furthermore, severe shock especially from burns, demands fluid and sodium in large amounts speedily as much as 15 per cent of the body weight in the first twenty-four hours.[39] Salt solution has superiority in the very property which once caused it to be rejected—namely, the ease with which any surplus passes from the blood stream into the tissues. There is thus the quickest supply of sodium needed by the damaged tissues. This need was missed by the former authorities who thought only of circulatory volume. In addition, there is relative safety from the plethora which would certainly be fatal if any such huge amounts of plasma were infused rapidly, and this safety factor is particularly important under emergency conditions such as an atomic disaster, when accurate estimations of plasma volume or fluid need are not feasible. Danger from ordinary saline infusions, as described by Coller,[11] is a rare manifestation of a special abnormality. The storage capacity of the normal organism is huge. According to experiments on cats, Cutting[12] estimated the human tolerance limit at 35 liters infused intravenously at 350 cc. per minute. My experiments showed that the capacity is not diminished in traumatic shock; hence the much smaller volumes which are used therapeutically can be given rapidly and fearlessly, except in the presence of obvious cardiovascular or other complications.

This is not the place to evaluate the merits of different sodium solutions, either of special salts such as the lactate, succinate or bicarbonate, or the addition of other ions, or a subisotonic dilution to avoid excessive sodium accumulation. It is desirable that the ideal composition should be ascertained and be made as freely available as possible. But, granting that the lactate is more palatable for drinking, the general efficacy of plain physiologic saline solution should be recognized. It can save fully as many shocked animals as Ringer's solution, and any greater saving by any of the special compounds is slight or questionable. Still greater leeway can be shown in experiments. If one investigator will crudely estimate a flat teaspoonful of table salt to a pint of tap water, filtered but not sterilized, while his companion uses a solution meticulously prepared chemically and bacteriologically, their results in shocked animals will be practically indistinguishable. This lesson can be applied clinically if conditions demand The preeminent fact for physicians to grasp is that the specific need in shock is for water and sodium salts, not for proteins or any other colloids, and the harmfulness of delay is such that the quick abundant administration of the simple fluid available in an emergency can save many lives which would be lost by waiting for blood, plasma or any ideal solution

B Hemorrhage—The subject of hemorrhage overlaps that of shock, because the same injury often causes both, the hypotension of uncomplicated hemorrhage may induce hemorrhagic shock, and the oozing of plasma after burns and some other injuries may have a hemodynamic effect somewhat like that of hemorrhage Three preliminary points should be clarified

1 Simple loss of plasma protein is never a cause of death or danger in shock Shock is an acute process limited to a number of hours or a day or two and the body has ample reserves to cover any losses due to burns or other injuries with this time This is one reason why the simple provision of water and sodium suffices in shock Any later needs pertain not to shock but to convalescence, and even then it will be uncommon to have hypoproteinemia without anemia Thus whole blood is needed rather than plasma Furthermore, it is recognized that treatment of persistent hypoproteinemia with plasma infusions is futile, because the quantities of protein which can be thus supplied in practice are too trivial Therefore the traditional bugaboo of hypoproteinemia in the acute crisis of shock and also the notion of a nutritive demand for plasma should be dismissed

2 The idea that plasma or other colloid solutions must remain in the blood vessels is fallacious The abnormal increase of capillary permeability in injured areas results in leakage of any kind of fluid This exudation is somewhat faster and greater with salt solution than with plasma But anybody performing tourniquet shock experiments on animals can readily observe the great swelling of the legs which occurs also with plasma infusions, and which increases with every increase of the infusion Therefore when local effusion is a serious danger, as in cases of intrathoracic or intracranial injuries, salt solution is more dangerous than plasma but plasma cannot be given with impunity and exudation will be least if no kind of fluid is administered In another eventuality, namely persistent bleeding there is the possibility of clotting of plasma while saline may cause dilution which conduces to hemorrhage But if the saline is given cautiously so that practically all of it passes into the injured tissues to supply their need for water and sodium, there will be less circulatory plethora than from an equal volume of plasma, hence less aggravation of hemorrhage by increased blood pressure

3 Mention was made previously of refrigeration for preserving limbs on which a tourniquet has been placed for stopping hemorrhage There has been no previous suggestion of another possibility—that under some conditions of critical hemorrhage Esmarch bandages with refrigeration may be used to press the blood out of all four limbs to make it available to the head and trunk The fatal shock produced in animals by tourniquets placed on only one or two legs for a few hours illustrates the dangers of this method especially in patients already weakened by hemorrhage, unless refrigeration is used to prevent shock

Disposal of these preliminary topics leads up to the central fact that only transfusion of whole blood can completely supply the two needs created by blood loss namely (*a*) red corpuscles to transport oxygen and (*b*) maintenance of hemodynamic and general nutritive functions Only the latter can be provided by plasma or other substitutes Omitting detailed references to the literature, an attempt may be made to clarify briefly the widespread confusion on this subject

An equilibrium is known to exist between the extracellular fluid inside and that outside the blood vessels It is modified but not abolished by the qualitative or quantitative changes connected with blood diseases, or by alterations of vascular permeability Ordinarily, hypoproteinemia from loss of plasma is rather rapidly compensated by inflow from the extravascular reservoirs but chronic hypoproteinemia signifies a deficit also of protein reserves, this cannot be overcome by any practicable amount of plasma infusions, because they mostly pass out of the circulation to preserve the mentioned equilibrium[43]

Nevertheless, plasma is the only material that can maintain qualitatively normal composition of fluids inside and outside the vessels.

The first plasma substitute, salt solution, has been condemned for its property of passing rapidly out of the blood vessels. This allegation, derived from old-time experiments of Pilcher and Sollman[14] with injections of limited amounts of saline solution in rabbits, would make this solution useless for shock and still more so for hemorrhage. But what happens if the solution which escapes from the vessels is replaced by still more of the same? This question was first raised in my experiments (1939-1941), which showed that sufficiently large infusions of simple saline readily maintained blood volume in both shock and hemorrhage. In other words, the capillary permeability, either when normal in hemorrhage or when abnormally increased in shock, is not unlimited, and fluid does not continue to pour out indefinitely. The reason was explained by Warren, Merrill and Stead,[41] who demonstrated the equilibrium between intravascular and extravascular fluid, in such manner that when salt solution has built up sufficient tissue turgor it proceeds to remain in the circulation. Thus all the writers who have demonstrated the equal value of plasma and saline in shock have had no difficulty in overcoming oligemia and maintaining blood volume, even in the presence of hypoproteinemia with its deficiency of water-binding by proteins. This process entails tissue edema in proportion to the hypoproteinemia. But, though such edema must be viewed as detrimental, it does not reach a dangerous degree in the brain, in the lungs or elsewhere, as can be proved in dogs bled from the carotid to exsanguination. Only artificial plasmapharesis can unbalance the equilibrium sufficiently to make circulation impossible. The special dangers involved with intrathoracic or intracranial wounds or with cardiorenal-vascular disease are understood. Therefore any scanty supplies of plasma should be reserved for such cases Otherwise emergency practice should take account of the fact that adequate circulatory volume can be maintained even after the most profuse hemorrhage by ample or repeated infusions of physiologic salt solution

Much labor has been devoted to finding so-called "plasma substitutes," in which other colloids serve in lieu of plasma proteins to obviate the large volume and the edematous effect of saline infusions. Beginning with gum arabic, the search has proceeded with gelatin and other proteins, pecten, polyvinyl alcohol, etc., to the recent dextran, with attention not only to the water-binding properties but (lately) to molecular configuration resembling that of protein. For shock, all these substances have shown benefit corresponding to the saline solution in which they are administered, and none of them has been proved useful without salt. Likewise, for hemorrhage, they have never been proved able to save any animal that could not be saved by simple saline. Furthermore, all these investigators have disregarded the law of equilibrium. None of these foreign colloids can remain limited to the blood stream. They all pass into the extravascular fluids and also are stored by tissue cells, with characteristically high concentrations in the liver. Harmful effects have been demonstrated from all of them after they have been tried thoroughly enough. In the choice of a plasma substitute, therefore, the inquiry must be whether it is preferable to have the tissues loaded with surplus water and salt or with a foreign colloid. It seems evident that the excess of salt solution is safer and also can be eliminated more rapidly, in contrast to the long retention of the colloids. Since every colloid other than the native proteins is abnormal as a constituent of both fluids and cells, the conclusion may be that a truly harmless replacement is impossible and the chimera of a plasma substitute should no longer be pursued.

A review of the literature of actual experiments with hemorrhage shows that all investigators have ranked plasma as superior to saline solution, always on the same erroneous basis of comparing equal volumes. The superiority of plasma over salt solution has never yet been demonstrated by comparing not equal but optimal quantities of each for hemorrhage in normal animals. Observations by McKee and his collaborators[15] are of crucial importance. Even by comparison of equal volumes they found that the fluids for treating hemorrhage are, in descending order of effectiveness, whole blood, saline suspension of red cells, plasma and saline solution In other words, the need for red corpuscles is preeminent, and the secondary hemodynamic need can be adequately supplied by saline

These facts should receive more adequate attention in advices and preparations for an atomic bombing catastrophe and also for military campaigns in Korea and elsewhere They may obviate the need for the prodigious or impossible quantities of plasma ordinarily demanded Even believers in the superiority of plasma must accept the unanimous evidence of the great value of salt solution and must recognize its advantages of prompt and abundant availability in conditions of emergency and disaster The present emergency furnishes urgent reasons for impressing these long neglected facts upon physicians

SUMMARY

The author reviews evidence of the important uses of reduced temperature treatment for radiogenic, mechanical and thermal injuries due to atomic explosion

The value of salt solution for both shock and hemorrhage is emphasized Insistence on exclusive use of plasma is deprecated and the search for a colloid "substitute' is criticized

However judgments may differ as to the benefits of these methods their established value together with their availability entitles them to a more important place in first aid instructions and in medical plans for the exigencies of atomic bombing or military campaigns

RÉSUMÉ

L auteur passe en revue l'evidence de l emploi impertant d une therapie, de basse temperature pour les lesions d origine radiogenique mechanique et thermique dues a l'explosion atomique L emploi de serum artificiel pour le choc et l hemorragie est demontre

L'auteur condamne l'emploi exclusif de plasma et critique la recherche pour un substitutcolloidal

Quoique les opinions different sur le benefice a obtenir a l'aide des differentes methodes recommandees leur valeur est etablie et leur facilite d obtention leur conferent une place de haute importance dans l instruction pour les premiers secours et dans les plans medicaux pour rencontrer les exigences du bombage atomique et des campagnes militaires

RIASSUNTO

L A passa in rassegna l evidenza dell impieghi importanti di terapia a temperatura riduttiva per danni radiogenichi meccanici e termali a causa di scoppio atomico

Il merito di soluzione salina per ambo shock ed emorragia viene accentuato Insistenza sul uso esclusive di plasma e' dissuasa e la ricerca per sostituti colloidi e criticata

Benche' opinioni potrebbero differire secondo i vantaggi dei metodi sostenuti loro valore fondato insieme all 'efficacita li intololano ad un posto piu importante nelle istruzioni del primo soccorso e nei progetti medicale pelle esigenze del bombardamento atomico e campagne militari

ZUSAMMENFASSUNG

Der Verfasser gibt einen Ueberblick ueber unsere Kenntnisse von den wichtigen Anwendungsmoeglichkeiten der Temperaturherabsetzung in der Behandlung von Verletzungen die im Falle einer atomischen Explosion auf radiogenem, mechanischem und thermischem Wege entstehen

Der Wert der Kochsalzloesung bei Schock und Blutungen wird betont Der Verfasser glaubt nicht, dass man auf der ausschliesslichen Anwendung von Plasma bestehen sollte und kritisiert das Suchen nach einem "Kolloidersatz"

Wenn auch die Meinungen ueber den Erfolg der empfohlenen Methoden geteilt sind, so verdienen diese doch auf Grund ihres erwiesenen Wertes und wegen ihrer leichten Durchfuehrbarkeit einen wichtigeren Platz im Unterricht ueber erste Hilfe und in der aertzlichen Planung der im Falle der Anwendung von Atombomben und eines Krieges zu ergreifenden Notmassnahmen

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Obstructive Jaundice Due to a Benign Tumor of the Extrahepatic Bile Ducts

Report of a Case

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OBSTRUCTIVE jaundice is most commonly due to a stone in the common duct, a stricture of the common duct, or a malignant lesion of either the ampulla of Vater or the head of the pancreas. Less commonly, icterus is caused by cysts in the biliary tract, benign tumors of the bile ducts or carcinoma of the common duct proximal to the ampulla or in the hepatic ducts. This report deals with a case of jaundice, unusual in that it was due to a benign sessile adenoma of the extrahepatic bile ducts. The true nature of the obstruction was unsuspected before operation. This case report is of particular interest because of the unusual postoperative complications necessitating heroic, although hopeless, measures.

REPORT OF CASE

W. S., a 47-year-old white man, was admitted to the Frankford Hospital on Dec. 29, 1947, with a diagnosis of "obstructive jaundice." The patient had been well until the day of admission, when he was attacked by intermittent pain in the upper part of the abdomen, occasionally severe enough to require morphine for relief. There was no radiation of the pain. No nausea, vomiting or change in bowel habit was observed. On December 25 the patient noticed that his urine was dark and his stools light, and that he was becoming icteric. No previous similar attack had occurred.

Physical examination revealed icterus as the abnormality. There were no abdominal masses, and the abdomen was not tender.

Laboratory studies confirmed the impression of "obstructive jaundice." A cholecystogram failed to visualize the gallbladder. After several days of intensive oral and parenteral preparation with protein, saline, dextrose and vitamins, operation was performed on Jan. 2, 1948.

With the patient under spinal procaine-pontocaine anesthesia, supplemented by pentothal and curare administered intravenously, a primary upper right rectus incision was made. Exploration of the abdominal cavity revealed no gross abnormalities in its lower part. Examination of the biliary tract disclosed a distended, thin-walled gallbladder which contained no stones, a dilated common duct, and a pancreas of normal size but firm. No stones or masses were felt along the course of the supraduodenal bile ducts. It was our impression at this time that we were dealing with an obstructing lesion along the course of the intrapancreatic portion of the common duct or the adjacent pancreas. Resective therapy was decided upon and a pancreatoduodenectomy was performed (Fig. 1). Although the cystic duct appeared to enter the hepatic duct well above the duodenum and at a right angle, transection of the common bile duct revealed the cystic duct to be running along the common hepatic duct in a common sheath, at least as far down as the pancreas (Fig. 2). This necessitated performing a cholecystectomy in addition to the pancreatic resection. Gastrointestinal and biliary-intestinal continuity was reestablished by an end-to-side choledochojejunostomy and an end-to-side anterior gastrojejunostomy. The former was placed about 10 cm. proximal to the latter. Although an attempt was also made to perform a pancreaticojejunostomy, the extreme friability of the pancreatic parenchyma and capsule forced us to abandon this procedure and merely to close over the cut end of the pancreas and bury it into the adjacent retroperitoneal tissues.

Examination of the resected specimen revealed a lesion in the common bile duct beginning approximately 1 cm. proximal to the papilla of Vater, involving the entire circumference for about 1 cm. along its course and completely obstructing the lumen. The cystic duct was seen entering the hepatic duct below the level of the lesion (Fig. 2). The pancreas was grossly normal. Microscopic examination of the lesion revealed a benign sessile adenoma (Figs. 3 and 4). The pancreas was entirely normal.

Postoperatively the patient received blood, intravenous proteins, dextrose, vitamins and large doses

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From the Surgical Service of the Frankford Hospital
Submitted for publication Nov. 27, 1950

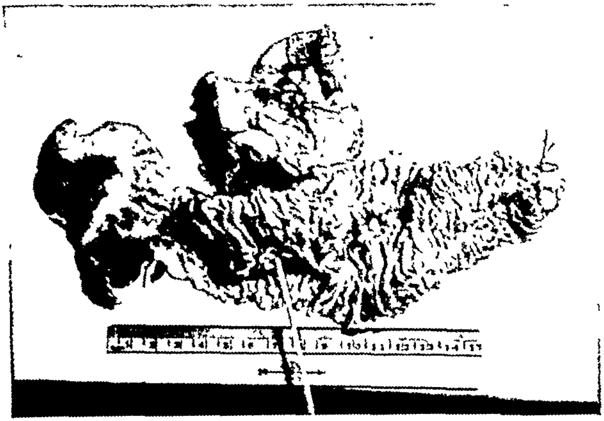

Fig 1—Resected specimen, consisting of the distal portion of stomach, entire duodenum and the proximal 2 inches (5 cm) of jejunum The portion of resected pancreas lies above The indicator points to the papilla of Vater

of penicillin and streptomycin On the third postoperative day bile drainage appeared on the dressings, and on the seventh day gastrointestinal contents were also seen All oral feedings were discontinued and continuous gastric suction instituted In order to maintain nutrition, a jejunostomy was performed through an upper left muscle-splitting incision the following day. Three days later the fistula stopped draining and oral feedings were again started The jejunostomy tube was removed a week later The course was further complicated during this time by bilateral parotitis, which promptly responded to several roentgen treatments

Three week after the primary operation the icterus had disappeared, the incision had healed and the patient was eating and gaining weight He was afebrile. On January 23, the day he was to leave the hospital, the patient suddenly vomited a large amount of bright red blood and went into a state of collapse. This responded to blood transfusions Similar attacks of hematemesis, syncope and tarry stools occurred almost daily. Though these attacks all responded rapidly to transfusions, it was felt that we could keep the patient's condition in a satisfactory state for only a short time longer Therefore, after his fourth hemorrhage, abdominal exploration was performed on January 29. With the patient under general anesthesia, a gastrotomy was performed All the clots in the stomach were evacuated and the organ carefully examined There was no active bleeding at this time, and except for an area of gastric erosion near the gastrojejunostomy no abnormality was observed Our impression was that we were dealing

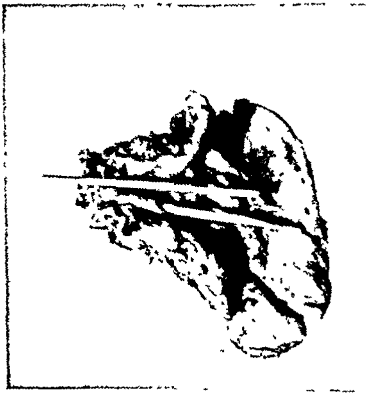

Fig 2—Cystic duct running along the course of the hepatic duct into the pancreas The hepatic duct has been opened along its course. The cystic duct entered the hepatic duct at the level of the lesion.

with erosive gastritis of a type occasionally encountered after a gastrojejunal anastomosis. This portion of the stomach was resected and the opening in the stomach closed.

On the day after this operation there was a recurrence of bleeding. Two days after the operation the abdominal wound became infected and drainage was instituted. After several bouts of hemorrhage, with the patient's condition gradually deteriorating in spite of numerous blood transfusions, we decided that it would be necessary to reexplore the stomach, particularly near the cardia, and, if necessary, remove the entire gastric remnant. Therefore, on February 1, through a left transthoracic incision in the ninth interspace, the pleural cavity was entered. There was some free fluid in the pleural cavity, and there was fibrinous pleuritis of the base of the lung and adjacent diaphragm. The diaphragm was incised and the abdominal cavity entered. Above and below the left lobe of the liver there was a collection of very foul pus. This was evacuated. The cause of the subphrenic and subhepatic suppuration and the bleeding then became apparent. The gastric remnant was tense and there were numerous abscesses in its wall. When the cardiac end of the stomach was opened, these abscesses were seen to involve the entire thickness of the stomach, and one of them was adjacent to the left gastric artery and had eroded into it (Fig. 5). This was the source of the severe hemorrhages. The abscesses were multiple and involved the greater portion of the gastric remnant. It was surprising to us that we had failed to see them at the previous exploration several days before. Nothing less than removal of the gastric remnant was considered feasible. This was done, and an end-to-side esophagojejunostomy was performed. The diaphragm and chest were then closed around tubes for water-sealed drainage. During the operation, which lasted five hours, the patient's condition was critical, and although he regained consciousness, he died twelve hours later of pulmonary edema. An autopsy was performed, but added nothing to our previous observations.

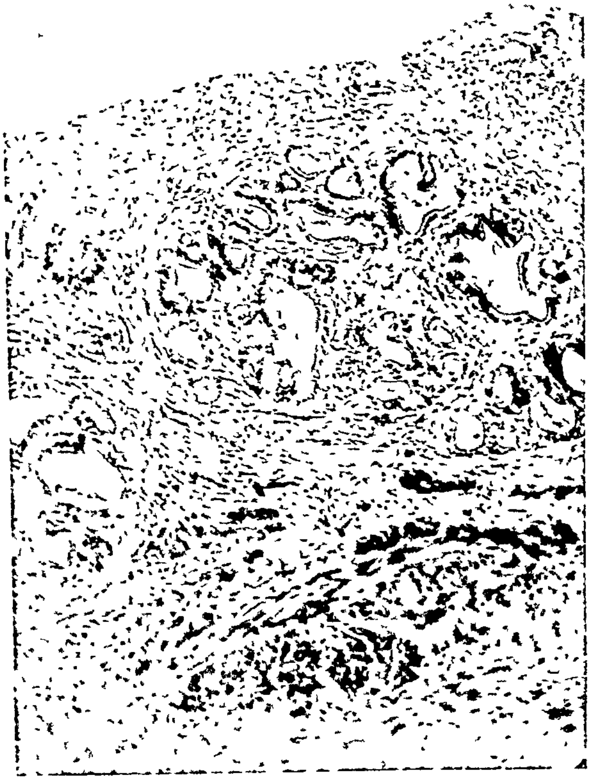

Fig. 3.—Low power microscopic section of the obstructing lesion. This pattern involved the entire circumference of the duct. There was no evidence of invasion.

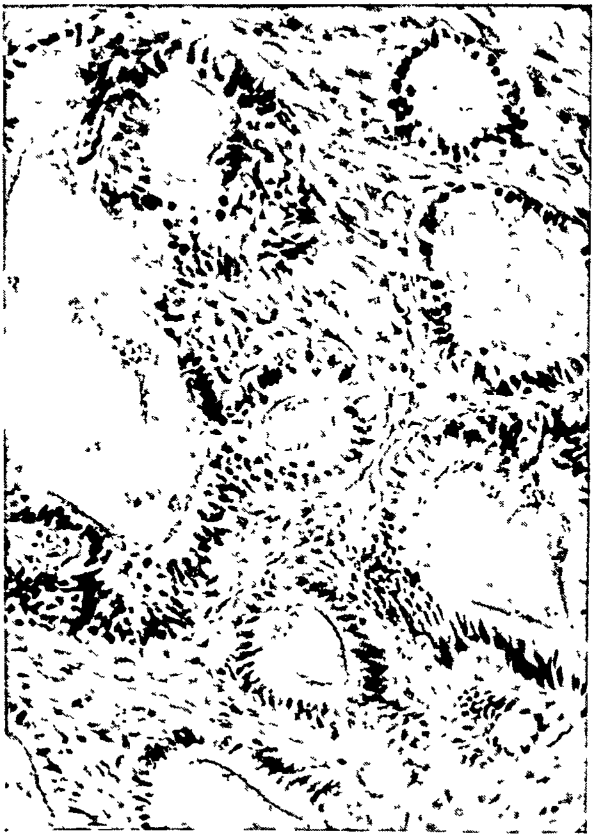

Fig. 4.—High power microscopic section of the same specimen, showing its benign characteristics

COMMENT

Benign tumors of the extrahepatic bile ducts have only infrequently been reported in the

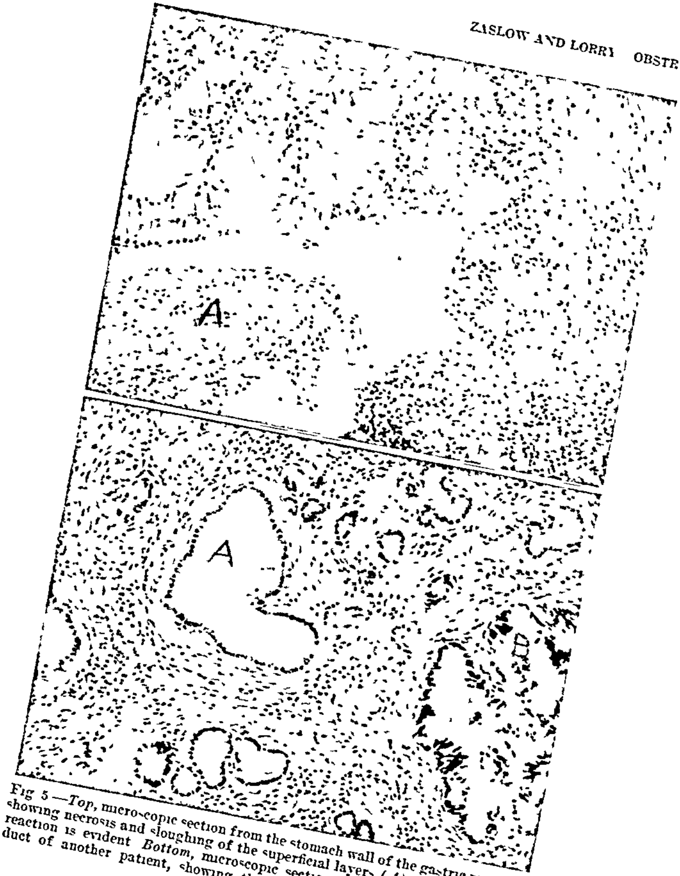

Fig 5—*Top*, microscopic section from the stomach wall of the gastric remnant, showing necrosis and sloughing of the superficial layers (*A*) The suppurative reaction is evident *Bottom*, microscopic section of a lesion in the common duct of another patient, showing the transition from hyperplasia (*A*) to malignancy (*B*)

literature These have included, in the main, adenomas (sessile and polypoid) and lymphogranulomas[1] They are even less common than the rare benign lesions of the ampulla of Vater[2] It is impossible to recognize the true nature of these growths before operation, and exploration is always done because of the obstructive jaundice present Even at operation the surgeon may be unable to differentiate between a benign and a malignant lesion without removing the specimen for microscopic examination In fact, this has usually been true of the cases reported in the literature, as well as in the one presented in this paper There-with erosive gastritis of a type occasionally encountered after a gastrojejunal anastomosis. This portion of the stomach was resected and the opening in the stomach closed.

On the day after this operation there was a recurrence of bleeding. Two days after the operation the abdominal wound became infected and drainage was instituted. After several bouts of hemorrhage, with the patient's condition gradually deteriorating in spite of numerous blood transfusions, we decided that it would be necessary to reexplore the stomach, particularly near the cardia, and, if necessary, remove the entire gastric remnant. Therefore, on February 1, through a left transthoracic incision in the ninth interspace, the pleural cavity was entered. There was some free fluid in the pleural cavity, and there was fibrinous pleuritis of the base of the lung and adjacent diaphragm. The diaphragm was incised and the abdominal cavity entered. Above and below the left lobe of the liver there was a collection of very foul pus. This was evacuated. The cause of the subphrenic and subhepatic suppuration and the bleeding then became apparent. The gastric remnant was tense and there were numerous abscesses in its wall. When the cardiac end of the stomach was opened, these abscesses were seen to involve the entire thickness of the stomach, and one of them was adjacent to the left gastric artery and had eroded into it (Fig. 5). This was the source of the severe hemorrhages. The abscesses were multiple and involved the greater portion of the gastric remnant. It was surprising to us that we had failed to see them at the previous exploration several days before. Nothing less than removal of the gastric remnant was considered feasible. This was done, and an end-to-side esophagojejunostomy was performed. The diaphragm and chest were then closed around tubes for water-sealed drainage. During the operation, which lasted five hours, the patient's condition was critical, and although he regained consciousness, he died twelve hours later of pulmonary edema. An autopsy was performed, but added nothing to our previous observations.

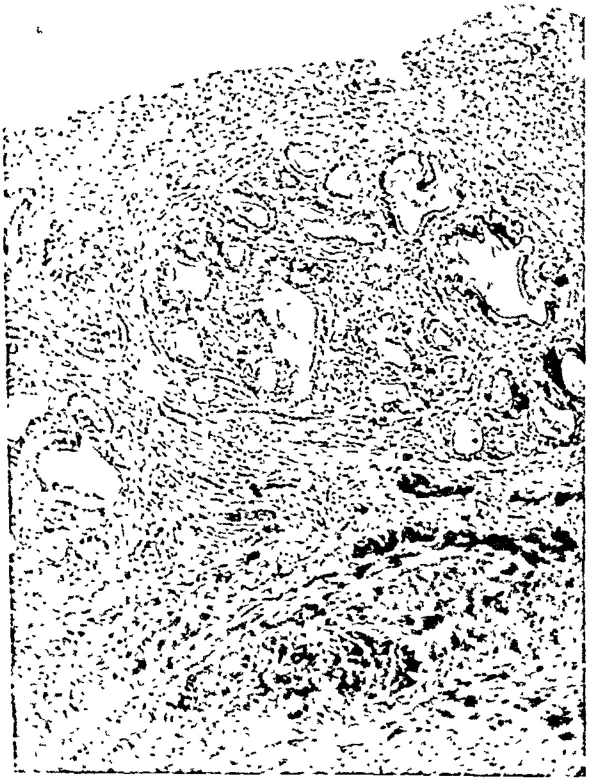
Fig. 3.—Low power microscopic section of the obstructing lesion. This pattern involved the entire circumference of the duct. There was no evidence of invasion.

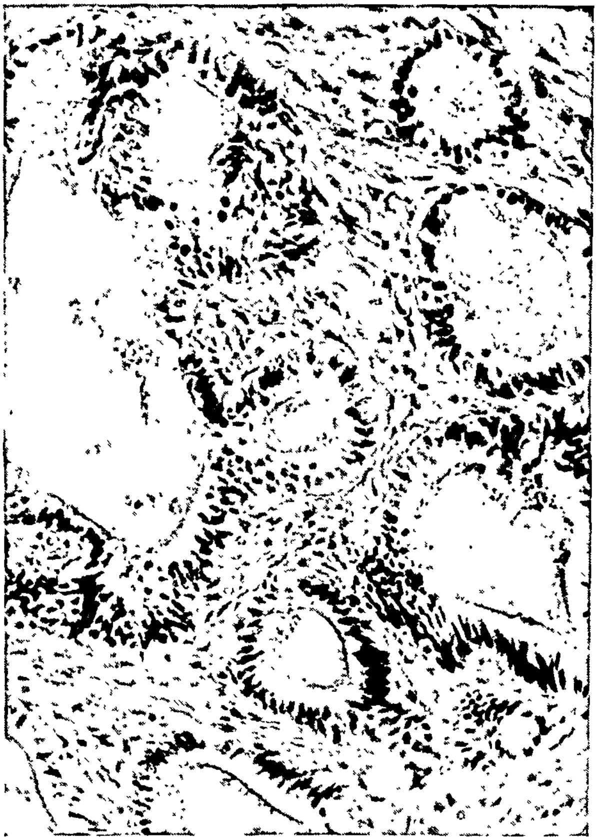
Fig. 4.—High power microscopic section of the same specimen, showing its benign characteristics.

COMMENT

Benign tumors of the extrahepatic bile ducts have only infrequently been reported in the

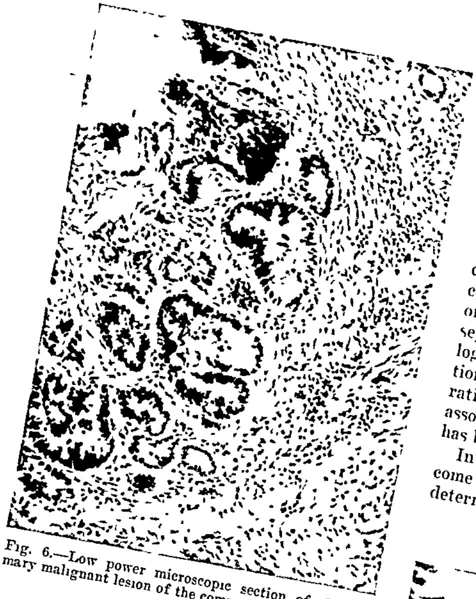

Fig. 6.—Low power microscopic section of the primary malignant lesion of the common duct in Figure 5.

isolated. Guy, Meyer and Brams[7] recorded a case of streptococcus bronchopneumonia with this condition. Gerster[8] expressed the opinion that injury of the mucosa by irritants was partly to blame. The last-mentioned author found phlegmon associated with ulcer or carcinoma in more than 50 cases, and felt that it was rarely a part of general sepsis Exhaustion from hard labor and hypoacidity of gastric secretions have been considered as causes.[9] Sundberg[10] noted that 25 per cent of the patients indulged excessively in alcohol Fink[11] was unable to produce the condition experimentally by injecting organisms into the gastric wall, although Doeble, cited by Vaughan,[12] produced cellulitis by feeding dogs alcohol, after which cultures revealed Streptococcus haemolyticus.

The clinical picture consists of the signs and symptoms of severe toxicity, together with local signs of pain and tenderness in the upper part of the abdomen, vomiting (sometimes of pus) and occasionally hematemesis. The diagnosis is rarely made before operation, but the local features of an acutely inflamed stomach, with or without subperitoneal abscesses, are characteristic.

Treatment has usually consisted of drainage of local abscesses. It is interesting to observe that many reported cases of recovery were cases in which the suppuration was observed coincidentally in specimens resected for ulcer or tumor, none of the aforementioned signs of sepsis being present.[6] It was a sort of pathologic curiosity. Whether any of these conditions would have progressed to diffuse suppuration is difficult to determine The mortality associated with the far-advanced involvement has been high.

In our own case the diagnosis did not become apparent until the second operation to determine the site of the bleeding was done.

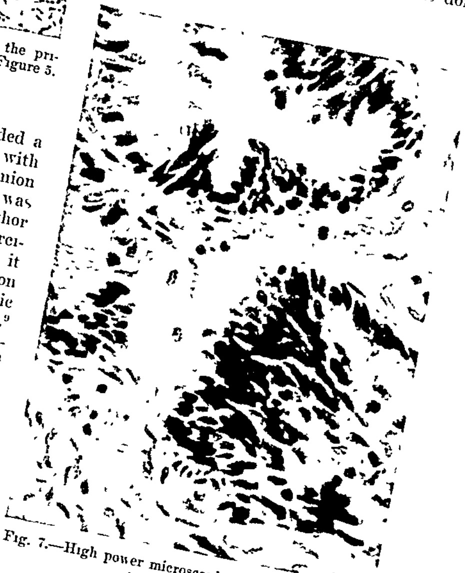

Fig. 7.—High power microscopic section of the specimen in Figure 6.

At no time after the first week was there any fever or epigastric pain. The suppuration had already extended beyond the wall of the stomach into the adjacent subphrenic spaces. The wall of the left gastric artery was eroded. The question might be raised as to whether the subphrenic infection was present first, involving the wall of the stomach and the gastric artery by continuity. This is unlikely, since numerous small abscesses were scattered in the gastric wall far distant from the subphrenic collection. In view of the extensive pathologic changes present, it became apparent that nothing less than removal of the gastric remnant would suffice.

SUMMARY

1. A case of obstructive jaundice due to a benign sessile tumor of the extrahepatic bile ducts is reported.

2. An interesting anomaly of the cystic duct and the development of phlegmonous gastritis of the gastric remnant, requiring radical although hopeless measures, are discussed.

RÉSUMÉ

1. Un cas de jaunisse obstructive due à une tumeur sessile et bénigne de conduits biliaires extrahépatiques est rapporté.

2. Une anomalie intéressante du conduit cystique et le développement du gastrite phlegmoneuse du bout gastrique demandant des mesures radicales (mesures pas toujours satisfaisantes) sont discutees.

ZUSAMMENFASSUNG

1. Es wird ein Fall von Obstruktionsgelbsucht. die durch einen gutartigen stiellosen Tumor der extrahepatischen Gallengaenge bedingt war, berichtet.

2. Eine interessante Anomalie des Ductus cysticus und die Entwicklung einer phlegmonoesen Gastritis des Magenstumpfes. die radikale (wenn auch hoffnungslose) Massnahmen erforderte. werden eroertert.

RESUMEN

1. Se da a conocer un caso de ictericia obstructiva debida a un tumor benigno sesil de los conductos biliares extrahepáticos.

2. Se discuten una interesante anomalía del cístico y el desarrollo de gastritis flegmonosa del remanente gástrico, que hubieron de tratarse radicalmente aunque sin esperanza.

RIASSUNTO

1. Deserive un caso d'itteriza ostruttivo causato d'un tumore sessile dei condotti extra epatica.

2. Discute un anomalo interessante del canale cistico e sviluppamento di gastrite flemmonoso del rimanente gastrico che richiede misure radicale (benché disperato).

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Nephroptosis

Some New Etiologic Conceptions

CLAY O MILLER, M D, F A C S, F I C S*

CHICAGO

NEPHROPTOSIS has been recognized as a distinct clinical entity and treated as such for many years either surgically or by application of kidney belts or abdominal supports The frequent complications of nephroptosis are being successively discovered and treated most effectively

Nevertheless it appears from a review of the literature that little has been added in the past forty or fifty years so far as etiologic factors are concerned Our forefathers in this branch of medicine considered the ptotic kidney a result of (1) poor development of the fascial envelopes, (2) poor nutrition and relaxation of the abdominal walls especially post partum, (3) trama, (4) general visceroptosis, with the kidney sharing the involvement, or (5) the shape of the renal fossae, shallow and elongated in the female or deep and pear shaped in the male

Several years ago my associates and I became interested in this subject purely by coincidence We were called upon to examine and treat an extremely obese woman with typical right renal colic

The patient was 40 years of age and had been overweight since birth For the past seven or eight years she had had mild attacks of pain and discomfort in the right loin, radiating to the right groin, if she lay down, this would usually disappear The most recent attack, however, had continued, and for the first time she had consulted her family physician for its relief

A complete urologic study revealed a markedly ptotic kidney and moderate hydronephrosis At operation a most interesting phenomenon was observed A right renal muscle splitting incision was made The perirenal capsule was opened, and as had been expected there was no loss of the fatty pad On attempting to mobilize the kidney in preparation for a nephropexy I observed a tough, fibrotic group of adhesions enveloping the entire lower pole of the kidney These bands were in no way related or attached to Gerota's fascia, and on careful dissection they coursed downward in a fanlike manner and appeared to end in the sheaths of the quadratus lumborum and iliopsoas muscles Although these bands would allow the kidney to ascend 3 to 4 inches (7 5 to 10 cm) they would not permit it to assume its normal position This was judged by the length of the ureter and the point from which the renal vessels arose from their respective main channels Further investigation revealed no evidence of such adhesions at the upper pole When these fibrotic bands were severed, the kidney could easily be placed in its normal position So striking were these observations that it was decided to study carefully all ptotic kidneys that came to operation

During the past eight years 50 patients with nephroptosis have been operated on, all of whom revealed anatomic arrangements almost identical with those just described, the only difference being in the density of the fibrotic bands Believing that these conditions were purely congenital, we sought an explanation in the embryologic development of the kidney In the fourth week of fetal life the caudal end of the nephrogenic cord or metanephros envelops the ureteral bud of the mesonephric duct like a cap Elongation of this offshoot from the caudal end of the mesonephric duct forms the ureter, branching of its end forms the pelvis, the calyces and the collecting tubules The metanephros forms glomeruli and the secretory duct system which eventually joins the collecting duct system The fusion of metanephros and ureteral bud occurs in th pelvic area, and between the f

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sixth week of embryonic life both migrate cephalad to the lumbar region, a distance of 3 somites.[2]

It is conceivable that the kidney in its ascent might retain some attachments to its original site or to any point along its course. If it failed to ascend at all, the result would be a pelvic kidney, a not uncommon clinical phenomenon. The ascent usually occurs retroperitoneally, but occasionally the kidney becomes enveloped by peritoneum, another congenital variation clinically observed. In its ascent the kidney does not always completely lose its connection with mesodermal structures along its path. Fibrous bands often persist, and, if they are stronger than the attachments of the kidney in its permanent position, assumption of the upright position will allow the kidney to be drawn downward. If the ureter is fixed at any point above the level to which the kidney drops, kinking and urinary obstruction occur. Mere mobility without ureteral obstruction is often seen without symptoms and without damage to the kidney; it requires no treatment.

The patients operated on were subjected to thorough preoperative and postoperative studies. The decision to operate was based on the following clinical and laboratory data:

1. Persistent pain or discomfort in the loin of the affected side.
2. Definite abnormal excursion of the kidney.
3. Roentgen evidence of obstruction: (*a*) delayed emptying of the renal pelvis and the ureter (thirty minutes to one hour); (*b*) hydronephrosis, or (*c*) hydronephrosis and hydroureter.
4. Persistent infection of the urinary tract, refractory to all antibiotics.

Buford[3] described fine bands of connective tissue running downward parallel to the ureter in the ptotic kidney and insisted that they must be dissected off as an important part of nephropexy. Dodson[4] advised complete liberation of the kidney and ureter from adhesive bands as a necessary part of kidney suspension. Adhesive bands to the duodenum[5] and to the ascending colon[6] have been described, the former causing symptoms referable to the upper part of the gastrointestinal tract and relieved by division of the adhesions followed by nephropexy. My associates and I have also observed on many occasions that these fibrotic bands enveloped the ureter, particularly the upper and middle thirds, in various ways, producing mild to severe kinking.

SUMMARY AND CONCLUSIONS

The author records a series of 50 cases of nephroptosis. Forty of the patients were female and 10 male. Among the female patients, nephroptosis was bilateral in 1; in 4 it was present on the left side and in 35 on the right. In the male patients (10 in all) it was on the right side in every instance. The authors cannot account for the predilection for the right side and do not consider it the sole cause of nephroptosis, but in their opinion it is a definite contributory factor and may well be the chief etiologic factor.

RÉSUMÉ

L'auteur rapporte une série de 50 cas de néphroptose, 40 femmes et 10 hommes. Chez les femmes, la néphroptose fut bilatérale chez une; dans 4 cas, elle fut presente du côte gauche et dans 35 du côte droit. Chez les hommes, elle fut du côte droit dans chaque cas. Les auteurs ne peuvent pas expliquer cette prédilection pour le côte droit et ne la considèrant pas la seule cause de la néphorotose, mais dans leur opinion, c'est un facteur contributeur qui peut être le principal facteur étiologique.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Der Verfasser berichtet ueber eine Serie von fuenfzig Faellen von Nierensenkung. Vierzig davon waren Frauen und zehn Maenner. Unter den weiblichen Kranken lag in einem Falle eine doppelseitige Nierensenkung vor; in vier Faellen handelte es sich um eine linksseitige, in fuenfunddreissig Faellen um eine rechtsseitige Senkung. Saemtliche zehn maennliche Kranke hatten die Erkrankung auf der rechten Seite. Die Verfasser koennen keine Erklaerung fuer das Vorwiegen der rechtsseitigen Erkrankung geben. Sie glauben nicht, dass hier allein die Ursache der Nierensenkung zu suchen sei, sind aber der Meinung, dass ein beitragender, vielleicht sogar der hauptsaechliche aetiologische Faktor vorliegen koennte.

RIASSUNTO

L'A registra una serie di 50 casi di nefrotosi Quaranta pazienti femmine e dieci maschi Fra le pazienti femmine nefrotosi, vi era un caso bilaterale, quattro al fianco sinistro e 35 a destra Nei maschi 10 casi in ciascuno istanza a lato destro Non calcolano la predilezione per la destra e non la considerano la causa unica del nefrotosi, ma l'opinione che sia un fattore contribuente definito e puó essere fattore principale etologica

RESUMEN Y CONCLUSIONES

El autor revisa una serie de 50 casos de nefroptosis 40 pacientes femeninos y 10 masculinos. En los *pacientes* femeninos, nefroptosis bilateral en 1, monolateral izquierda en 4 y monolateral derecha en 35 En los pacientes *masculinos (10 en total) monolateral derecha* en todos Los autores no pueden explicar la predileccion lateral derecha y no considerarla la unica causa de nefroptosis, pero es en su opinion un factor contribuyente definido y puede bien ser el factor etiologico principal

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The United States Chapter of the International College of Surgeons

announces the creation of Junior Membership in the College The House of Delegates, meeting on Dec 18, 1949, established this new form of membership, with the following requirements

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Case Reports

Beryllium Granuloma of the Web of the Thumb Following Injury

Report of a Case

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THIS study presents the important features of an injury to the web of the thumb by broken neon tubing followed by a beryllium granuloma. In addition, an analysis of 14 similar cases from the literature is included.

Literature.—Van Ordstrand, Hughes, DeNardi and Carmody[1] in 1945 reviewed the literature pertaining to the effects of beryllium and described cutaneous lesions and lesions of the respiratory tract suffered by workers in the beryllium industry. In addition to contact dermatitis and chronic ulcer of the skin, Grier, Nash and Freiman[2] discussed in detail subcutaneous granulomas developing after traumatic implant of beryllium compounds. Other authors[3] have added to the information made available by those mentioned.

Clinicopathologic Features. — The most striking features of these lesions are their chronicity and their tendency to recur after attempted removal. In general, most patients with beryllium granuloma of the skin have suffered a skin laceration from a broken fluorescent tube. The laceration may have been sutured primarily, or it may have seemed of insufficient extent to require surgical attention. After the skin has healed (occasionally it does not heal) there may develop one or more cutaneous and/or subcutaneous nodules of firm gray-white to yellow tissue, which ulcerate and continue to drain.

Recurrence is common after incomplete local excision, and many years may pass before complete cure is effected by radical excision, which may of necessity be mutilating to the part. In 1 case[3b] the lesion drained for four years before complete excision was effected. No migration and no regional lymph node spread has been observed.[3c] The local tissues are, however, involved by direct extension.

REPORT OF CASE

E. D., a white youth aged 16, sought treatment in February 1948 for an ulcer of the web of the left thumb which had recurrently opened and drained and closed spontaneously. Late in 1946, while his hands were covered with fluorescent powder, the web of the left thumb had been lacerated with a broken glass tube from a neon lamp. The diagnosis of foreign body granuloma was made and local excision performed. The wound continued to drain, however, and in August excision was again attempted. This wound also failed to

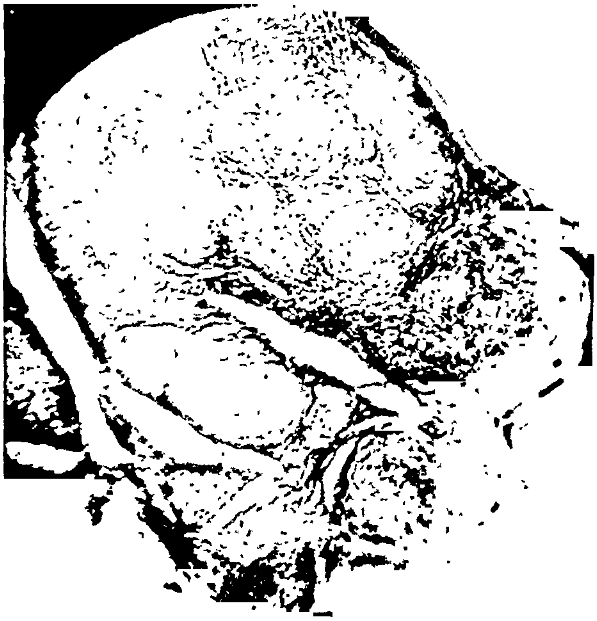

Fig. 1.—Nodular growth of chronic granulation tissue with a multinucleated giant cell (X 100).

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heal until July 1949, when wide excision of the ulcer and underlying granulomatous tissues was performed, with removal of a block of tissue measuring 3 by 1 cm The granuloma was of firm, friable gray white tissue and involved the skin, the subcutis and the adductor muscle of the thumb

Examination five months later revealed no recurrence Roentgen examination of the chest showed no evidence of pulmonary involvement There was moderate disability of thumb movements

Microscopically, sections of skin, subcutis and skeletal muscle (adductor pollicis) showed varying degrees of replacement by chronic granulomatous tissue (Fig 1) The latter was arranged in lobules incompletely separated by strands of compressed, collagenous connective tissue, with which they merged The large lobules were composed of small confluent nodular whorls of immature connective tissue cells ("epithelioid cells) with relatively cellular centers and fibrous peripheries (Fig 2) Within many of the small nodules were 1 or 2 multinucleated giant cells with eosinophilic cytoplasm and 3 to 6 oval nuclei, generally clumped in the center of the cell No inclusion bodies were identified In a few areas the centers of the large lobules were necrotic (caseation necrosis) Peripherally there was scant to moderate lymphoid cell infiltration with a few plasma cells

Analysis of the tissues excised revealed beryllium present in the concentration 0 14 gamma per 0 7 Gm of moist, fixed tissue (0 2 gamma per 1 0 Gm)

In fields showing no necrosis, the lesion simulated Boeck's sarcoid as described in previous reports Apparently the degree of necrosis and lymphocytic infiltration and the concentration of multinucleated giant cells vary between cases In this lesion the predominant feature was the nodular growth of cellular granulation tissue

COMMENT

Chronic granuloma following the traumatic introduction of beryllium compounds into and beneath the skin will develop and recur unless complete debridement is done at the time of injury Of interest is the observation that workers in whom pulmonary beryllium granulomatosis develops constitute only 6 per cent of those exposed[9] It may be that the relative scarcity of cases such as those reviewed is in part due to failure to respond to the contaminating beryllium by the production of granulomas To our knowledge, no report has been made of wounds contaminated with beryllium and *failing to show granulomatous* change The incidence of beryllium granuloma will be decreased further by discontinuance of the use of beryllium phosphors in the manufacture of fluorescent tubes

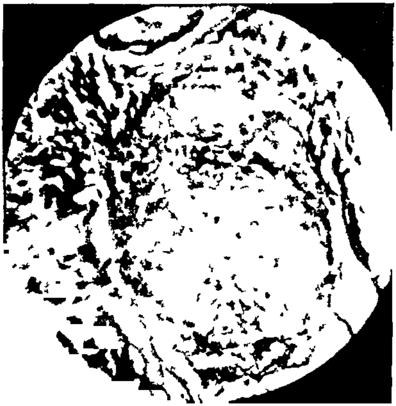

Fig 2—"Epithelioid' cells forming nodular whorls in the granuloma (× 440)

SUMMARY

1 A brief review is presented of the literature pertaining to chronic granulomas which follow cutaneous lacerations contaminated by fluorescent powder containing a beryllium compound

2 One case of beryllium granuloma is reported The tumor occurred in the web of the left thumb after laceration by broken neon tubing while the skin was covered with fluorescent powder

3 Complete debridement or excision is necessary to prevent the development or recurrence of the granuloma

4 Attention is called to the fact that only 6 per cent of persons exposed to beryllium compounds have pulmonary granulomatosis and it is suggested that not all wounds contaminated by beryllium are liable to the development of granuloma

RÉSUMÉ

1 Une breve revue est presentee concernant le granulome chronique consécutif aux lacera

tions cutanées contaminées par la poudre fluorescente renfermant un composé de beryllium.

2. Un cas de granulome dû au beryllium est rapporté. La tumeur se développa à la base du pouce gauche après lacération par un fragment de tube de néon, la peau étant à ce moment couverte de poudre fluorescente.

3. Un débridement complet ou une excision est nécessaire pour empecher le développement ou la récidive du granulome.

4. Il n'y a que seulement 6% des personnes exposées aux composés de béryllium presentent une granulomatose pulmonaire et il est suggéré que toutes les plaies contaminées par le béryllium ne développement pas la granulomatose.

RIASSUNTO

1. Esamina una breve rivista della letteratura appartenente a granulome chroniche seguente lacerazioni contaminati da polvere fluorescente contenente composto di Beryllio.

2. L'A presenta un caso. Il tumore rappresentato nel velo del pollice sinistro seguente lacerazione con tubo Neon spezzato mentre la pelle era coperta di polvere fluorescente.

3. Debridement completo od eccizione e' necessario prevenire sviluppamento o ritorno del granuloma.

4. Presta attenzione al fatto che solo 6 per cento delle persone esposti ai composti Beryllio soffrano del granulomatosi polmonare, e dichiare che non tutti feriti contaminate da Beryllio sono soggetto al sviluppamento del granuloma.

RESUMEN

1. Se presenta una breve revisión de la literatura referente a granulomas crómicos consecutivos a laceraciones cutáneas contaminadas por polvo fluorescente conteniendo un compuesto de berilo.

2. Se da a conocer un caso de berilogranuloma. Tumor en el tejido del pulgar izquierdo después de laceración producida por la ruptura de un tubo de neón con empolvamiento fluorescente cutáneo.

3. Se necesita la desbridación o excisión completas para prevenir el desarrollo o recurrencia del granuloma.

4. Se llama la atención sobre el hecho de que solamente el 6 por ciento de las personas expuestas a los compuestos de berilo tienen granulomatosis pulmonar, sugiriéndose que no todas las heridas contaminadas con berilo son susceptibles del desarrollo de granuloma.

ZUSAMMENFASSUNG

1. Es wird eine kurze Uebersicht der Literatur ueber chronische Granulome gegeben, die im Gefolge von Hautverletzungen, die mit fluoreszierendem berylliumhaltigom Pulver verunreinigt worden sind, entstehen.

2. Ein Fall von Berylliumgranulom wird berichtet. Die Geschwulst trat in der Falte zwischen dem linken Daumen und Zeigefinger auf, machdem eine Gewebszerreissung durch ein zerbrochenes Neonrohr stattgefunden hatte, waehrend die Haut mit fluoreszierendem Pulver bedeckt war.

3. Ein vollstaendiges Débridement oder vollstaendige Exzision ist notwendig, um der Entwicklung oder dem Widerauftreten des Granuloms vorzubeugen.

4. Es wird darauf aufmerksam gemacht, dass nur 6% aller Personen, die mit Berylliumverbindungen in Beruehrung kommen, eine Granulomatose der Lungen aufweisen, und es wird angenommen, dass nicht alle Wunden, die mit Beryllium verunreinigt sind, notwendigerweise zur Entwicklung von Granulomen fuehren muessen.

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Acknowledgments

Analysis of the excised tissues was made by Dr. L. Steadman, Atomic Energy Project, University of Rochester, Rochester, New York. The tissues were examined by Dr. James K. Scott of the same project.

Monoamniotic Twin Pregnancy

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MONOAMNIOTIC twin pregnancy is of sufficient rarity to warrant a report

Mrs C D R, a 28 year old woman who had given birth twice and was pregnant for the third time, was first seen on Aug 12, 1944, complaining of nausea and vomiting for fifteen days The last menstrual period had occurred on July 20 The uterus was enlarged to the size of a three months pregnancy No physical abnormalities were observed except that the blood pressure in millimeters of mercury was 130 systolic and 98 diastolic

The prenatal course was complicated throughout by nausea and vomiting, which necessitated admission to the hospital for a few days, beginning September 13 On Feb 13, 1945, the patient began to exhibit slight edema, and the abdomen was large A diagnosis of hydramnios with possible twins was made, although only one fetal heart beat could be heard No roentgenogram was taken, for financial reasons

On March 24 the patient complained of a sudden increase in fetal movements for approximately one hour Fetal heart tones were heard the next day in the left lower abdominal quadrant, and no abnormality was observed

On April 1, at 7 30 p m, the patient went spontaneously into labor At 11 p m the membranes ruptured spontaneously and a large amount of amniotic fluid was spilled At 11 11 p m a low forceps delivery was accomplished, after left mediolateral episiotomy, of a viable male child weighing 6 pounds 1 ounce (2 8 Kg) The second child, also male, presented by vertex, was born by podalic version and breech extraction and was macerated The placenta separated spontaneously and was expressed manually There was one placenta, with two cords intertwined and knotted into a cluster of knots that could not be separated There was only one amniotic sac, with no indication of a partition remnant

The postpartum course was uneventful, and the patient was discharged from the hospital on the fourth day

COMMENT

Quigley, in a comprehensive review of monoamniotic twins in 1935, stressed the rarity of the condition and stated that from the time of the first report in the seventeenth century to 1935 he was able to find but 108 authentic cases to which he added 1 of his own Clinically, the chief interest is the danger of death of one or both of the fetuses from twisting or knotting of the cords This results in a high fetal mortality rate, but there is no more risk to the mother than in any other twin pregnancy In the 94 cases in which it was possible to estimate mortality, Quigley found the fetal death rate to be 68 per cent Both twins survived in only 17 instances, both died in 42, and 1 died in 21 He reported 58 instances of true knot formation in the 109 patients, an incidence of 53 per cent

Since Quigley's report, only 5 additional cases have been reported in America In 1 case both twins survived (Parks and Epstein), 1 twin of Rucker's patient survived, and in the other 3 both twins died before the onset of labor In all of these patients, including the one whose case is reported here the cord revealed true knotting, changing the incidence to 55 6 per cent

Of the 115 cases reviewed, both twins survived in only 18, a 15 3 per cent chance The corrected mortality rate revealed 134 deaths among 200 babies changing the death rate to 67 per cent

SUMMARY

A case of monoamniotic twin pregnancy is reported Both children were boys, 1 proved to be viable, the other was macerated There was one placenta, with two cords knotted together The postpartum course of the mother was uneventful

RÉSUME

Un cas de grossesse jumellaire monoamniotique est rapporté Les deux enfants furent males, un était viable, l'autre etait macéré Il y avait un placenta unique ayant deux différents cordons noués ensemble La mere s'est retablit sans incident

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Stillborn, macerated monoamniotic twin. Photograph shows knotted cord that caused death.

ZUSAMMENFASSUNG

Ein Fall von Zwillingsschwangerschaft in einem einzigen Amnion wird berichtet. Beide Fruechte waren maennlich; eine erwiess sich als lebensfaehig, die andere war mazeriert. Es war nur eine Plazenta vorhanden und beide Nabelschnuere waren fest miteinander verknotet. Was die Mutter angeht, so war der Verlauf nach der Geburt ein normaler.

RIASSUNTO

Un caso di gravidanza gemellare monoamniotico e' rapportato. Ambidue erano ragazzi; l'uno vitale, l'altra macerato. Vi era una sola placenta con due corde separti annodati strettamente. Il corso postpartum della madre era poco fecondo d'avvenimenti.

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New Instruments

New Cervical Collar for Injuries of the Neck

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With the advancement of the treatment of minor cervical injuries, there has been an increasing need of a cervical collar that is not only comfortable to wear but holds up under continuous use over a period of weeks or months

The gap between the Schanz collar, other soft supports and the rigid cervical brace is a wide one The semirigid collar here described was designed not only to fill this gap but to supplant the Schanz collar and offer an appliance that really gives support to the neck and permits varying degrees of hyperextension

In adjusting this collar, the upper strap is tightened to such a position as to bring the forward ends of the collar to a comfortable position under the chin (see illustration) The lower strap is then tightened until a sufficient degree of hyperextension is attained

The collar is being made in four sizes, and its cost is considerably less than that of a brace It has been in the process of development for many months and will doubtless be further perfected during manufacture It is decidedly an intermediate means of support between the Schanz collar and the cervical brace and is applicable to a wide variety of conditions

RÉSUMÉ

NOUVEAU COLLIER CERVICAL POUR LE TRAITEMENT DES TRAUMATISMES DU COU

Avec les progrès dans le traitement des lésions minimes du cou, il y a un besoin important pour un collier non seulement confortable pour le malade, mais aussi qui se maintient pour un emploi continu d'une période de plusierures semaines ou mois

La différence entre le collier de Schanz et d'autres supports mous et rigides du cou est grande Le collier semi rigide figuré ci dessus a pour but non seulement de remedier ce vide, mais aussi de remplacer le collier de Schanz et d'offrir un appareil qui forme un support pour le cou et qui permet différents degrés d'hyperextension

En adjustant ce collier, la courroie supérieure est serrée de telle position a ce que la partie antérieure du collier soit confortablement placé sous le menton La courroie inferieure est alors serrée afin d'obtenir un degre suffisant d'hyperextension

Ces colliers sont faits de quatre dimensions et leur cout est raisonnable

Depuis longtemps, ces supports sont en voie de developpement et ont ete perfectionnés Il est probable que d'autres perfectionnements seront apportes dans leur fabrication Néanmoins, ils présentent de grands avantages et leur emploi est souvent indiqué

EIN NEUER HALSKRAGEN IN DER BEHANDLUNG VON GENICKVERLETZUNGEN

Im Laufe der Entwicklung auf dem Gebiete der Behandlung leichterer Genickverletzungen hat sich ein wachsendes Beduerfnis nach einem Halskragen geltend gemacht, der nicht nur fuer den Patienten bequem tragbar ist, sondern der auch den staendigen Gebrauch ueber einen Zeitraum von mehreren Wochen oder Monaten gut aushaelt

Die Kluft zwischen dem Schanzschen Kragen, anderen weichen Stuetzen und der starren Halsschiene ist weit Der oben beschriebene halbsteife Kragen wurde nicht nur entworfen, um diese Luecke zu fuellen, sondern auch um den Schanzschen Kragen auszuschalten und durch einen Apparat zu ersetzen, der dem Halse eine wirkliche Stuetze gibt und gleichzeitig die Anwendung verschiedener Grade der Ueberstreckung gestattet

Um diesen Kragen einzustellen, wird der obere Riemen so lange angespannt, bis die vorderen Enden des Kragens bequem unter

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*This collar was developed with the aid of Mr Robert G Blair Jr of Blair s Braces Inc Orlando Florida

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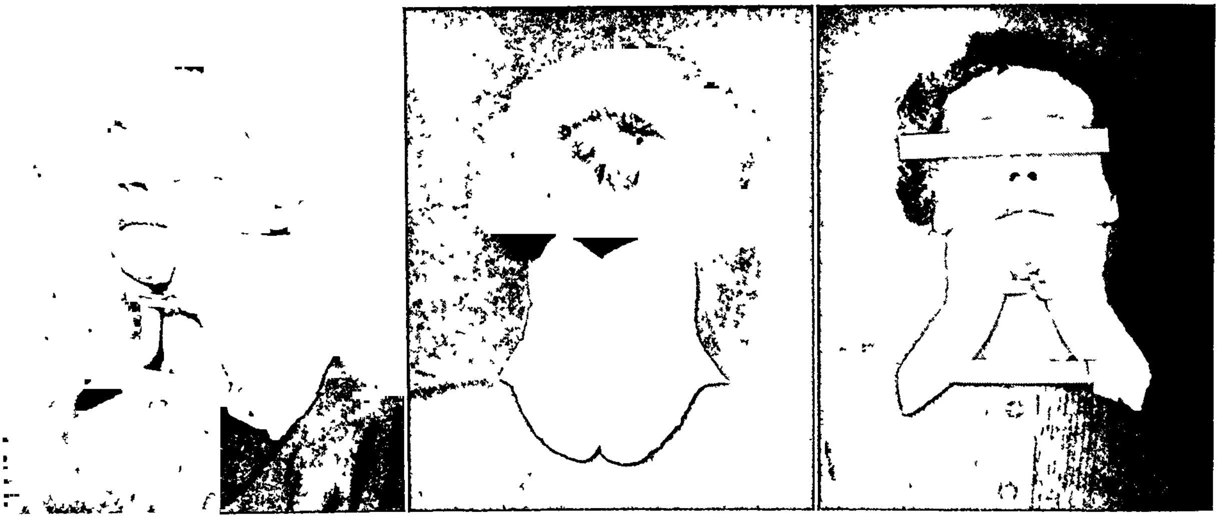

New cervical collar representing improvement over Schanz collar and usual cervical brace.

das Kinn zu liegen kommen. Dann wird der untere Riemen angespannt, bis ein ausreichender Grad der Ueberstreckung erreicht ist.

Diese Kragen werden in vier Groessen hergestellt und kosten erheblich weniger als Schienen.

Die oben beschriebene Halsstuetze befindet sich seit vielen Monaten im Stadium der Entwicklung und Vervollkommnung, und wahrscheinlich werden noch weitere Verbesserungen in ihrer Herstellung eintreten. Sie stellt ganz gewiss zwischen dem Schanzschen Kragen auf der einen und der Halsschiene auf der anderen Seite einen Mittelweg der Stuetzung dar, fuer den ausgedehnte Anwendungsmoeglichkeiten bestehen.

UNA NUOVO COLLARE CERVICALE PEL TRATTMENTO DI TRAUMATISMI DEL COLLO

Col progresso del trattmento di danni minori del collo vi e' stato un bisogno aumentando per un collare cervicale che non e' soltanto comodo al paziente di portare, ma ugualmento si sostiene sotto uso continuo al di la' d'un periodo di parecchi settimane o mesi.

Il cavo fra il collare Schanz, altri sostegni molli e la cinta cervicale rigida, e' largo. Il collare semi-rigida ritratto sopra e' stato designato non soltanto ad empire questo cavo, ma anche a soppiantare il collare Schanz ed offerire un mezzo che da' veramente al collo con diversi gradi d'iperestensione.

Nel aggiustamento di questi collari la fascia superiore e' stretta in tale posizione che porta le fini avanti del collare comodo sotto il mento. (Illustrato) La fascia inferiore poi va stingere finche' si arriva un grado bastante d'iperestensione.

Questi collari vengono in quattro grandezze, ed il prezzo e' considerabilmente meno che quello della cinta.

Il sostegno del collo lassu' illustrato e' stato nel corso dello sviluppo e della perfezione per tanti mesi, vi saranno propabilmente ancora miglioramenti nella manifattura. Intanto e' definitivamente un mezzo intermedio di sostengno fra il collare Schanz e la cinta cervicale, con ampiezza d'applicazione.

All will agree that a large proportion of the work of a medical student should be in the laboratory and in the hospital.—*Sir William Osler*

Sección en Español

Influência do Tipo de Anestesia no Tempo Operatório da Ressecção Gástrica

EURICO BRANCO RIBEIRO, M D F I C S*
SÃO PAULO, BRAZIL

AO focalizar a questão da influência do tipo de anestesia no tempo operatório da ressecção gastrica não temos a intenção de fazer a apologia da rapidez nas intervenções cirurgicas Si é certo que reconhecemos as vantagens de se agir com rapidez no campo operatório colocamos porém em primeiro plano o fator segurança que de forma alguma pode ser menosprezado em favor da diminuição do tempo necessário para levar a cabo o áto cirúrgico

Com o seu adestramento que se aperfeiçoa mais ou menos rápidamente de acordo com habilidade individual condições de aprendizagem e intensidade do traquejo — vae o cirurgião adquirindo a segurança de ação que o faz confiar em si próprio e lhe vae dando cada vez maior desenvoltura no campo operatorio O grau de habilidade é fator individual que se póde com esforço dirigido aperfeiçoar acentuadamente, a aprendizagem adquirida em determinado Serviço pode sofrer evolução para melhor em viagens de estudo ou no convivio de congressos e de sociedades sabias, e o volume de serviço si vultoso oferece oportunidades sem conta para um amplo aprimoramento de técnica Quando favorecido por esses três fatores ou quando procura tirar partido deles o cirurgiao logo se torna senhor do campo cirurgico, agindo com segurança So então é que em sã consciência pode se preocupar com a diminuição do tempo operatório E é seu dever faze lo para que seus doentes se aproveitem das vantagens da rapidez do ato cirúrgico, entre as quais sobressaem quantidade menor de substâncias anestésicas menores perdas de liquidos menores probabilidades de choque etc

Não deve pois o cirurgião protelar rotineiramente um ato cirúrgico que o seu adestramento permite realizar em tempo bem menor que o gasto pelos cirurgiões com quem aprendeu ou trabalhou si estes pertenciam a uma escola que operava por demais lentamente Na mesma ordem de ideias não se deve afoitar e querer agir muito depressa um cirurgião novo ainda mal adestrado que tenha feito ou esteja fazendo seu traquejo com cirurgioes habeis e rápidos

O presente estudo é baseado numa série de intervenções consecutivas sobre o estômago em que pudemos realizar a ressecção Tomamos como ponto de partida o ano de 1935, quando já tinhamos cerca de 10 anos de convivio com a mesa operatória prazo geralmente considerado suficiente para que o individuo adquira os foros de cirurgião e possa ingressar nas academias e na catedra Sem dúvida que o adestramento individual pode se aperfeiçoar depois desse prazo mas a desenvoltura aí ja adquiriu uma estabilidade tal que pouco poderá variar o fator individual nesse tipo de estudo a que nos propomos fazer

A inclusão de todos os casos e um impositivo da finalidade visada verificar a média do tempo operatório de determinada intervenção executada num mesmo Serviço por um unico operador a relaciona lo com o tipo de anestesia empregada Assim não foi excluido um só caso, mesmo aqueles que por circunstâncias especiais tiveram um ato operatorio prolongado por 2 e até mais de 3 horas foram computados como tambem foram computados aqueles extremamente faceis, em que à intervenção foi realizada na casa dos 30 minutos registando 32½ minutos o tempo recorde

Definimos como "tempo operatorio' o tempo que decorre desde o inicio da incisão cutânea até a colocação do ultimo ponto da pele Em nossos casos o tempo é marc a
mação de um quarto de

---

*Diretor do Sanatorio Sao Lucas

QUADRO I.—*Influência do tipo de anestesia no tempo operatório da gastroduodenectomia parcial*

1-1-1935 a 31-10-1950

		No câncer		em outras indicacões	
Anestesia local		nº de casos	tempo medio	nº de casos	tempo médio
621		38	94,52	583	83,10
Anestesia geral	inalação	32	84,79	203	67,13
293	via venosa	1	87,00	57	66,72
Anest, raqueana	pura	24	59,77	388	59,35
464	associada	5	114,80	47	76,79
1.378—total		100		1.278	
	raque + local	3	106,66	40	73,84
	raque + inalação	1	147,00	6	92,91
	raque + venosa	1	107,00	1	98,00

O tempo é marcado em minutos e fração decimal de minuto.

cronômetro assinalou 58 minutos e 44 segundos, consignamos o tempo de 58 minutos e meio; si assinalou 58 minutos e 46 segundos, consignamos o tempo operatório de 59 minutos.

A influência do tipo de anestesia no tempo operatório da ressecção gástrica não é obsuluta, mas depende, em parte, da técnica seguida e da moléstia em causa. Si na grande maioria dos casos empregamos a ressecção a Polya, com boca total e anastomose retrocólica, em muitos casos fazemos a gastrojejunostomia antecólica e em alguns a gastro-duodenostomia á Bilroth I, devendo assinalar que tambem estão incluidos neste estudo os casos de úlcera jejunal posoperatória, nos quais o manuseio é geralmente dificil e por vezes muito acrescido o número dos tempos operatórios.

Nos casos de câncer, em geral o áto cirúrgico tambem é mais trabalhoso e, por conseguinte, mais demorado. Mesmo nas úlceras, condições locais de séde e estado da lesão e de comprometimento de outros órgãos, como aderências ao figado e á vesícula e perfuração do pâncreas, apresentam sensivel desigualdade para o manuseio do campo operatório, determinando uma elasticidade por vezes grande do tempo operatório. Deve-se levar em conta, tambem, a sincronização da equipe cirúrgica em ação, sabendo-se que o mesmo cirurgião quando trabalha com assistentes acostumados a sua técnica obtem maior rendimento do que quando trabalha com assistentes novos ou com aprendizes. Óra, em nosso Serviço mantemos um curso prático de aperfeiçoamento e frequentemente temos estágiarios intervindo conosco no campo operatório. É esse, sem dúvida, um fator desfavoravel em nosso Serviço para a obtenção de melhores tempos operatórios.

Todas essas circunstâncias concorrem para a variabilidade do tempo operatório, mas, numa estatística longa e de certo vulto, como a que aquí apresentamos, tais fatores podem ser considerados diluidos, de forma a não invalidar qualquer conclusão que se queira tirar ao comparar os dados obtidos na função do tipo da anestesia empregada.

Assim sendo, vejamos os números.

Em nosso Serviço, de 1935 a 1950 (até 31 de outubro), num total de quasi 16 anos, registamos 1.378 gastroduodenectomias parciais, sendo 100 por câncer e 1.278 por úlceras e outras indicações (gastroptose, lesões benignas, tuberculose, sifilis, hipertrofia em anel da musculatura do antro pilórico, diverticulo do duodeno).

Conforme o tipo de anestesia, os nossos casos podem ser assim distribuidos:

	nº	%
Anestesia local	621...	45,1
Anestesia raqueana	464...	33,7
Anestesia geral	293...	21,2
Total	1.378	100,0

Os dados relativos aos casos de câncer foram computados à parte, conforme o quadro geral aquí apresentado. Por eles se vê, de uma forma geral, que o tempo dispendido nessa indicação da gastrectomia é sensivelmente maior que o tempo gasto em outras indicações, a não ser nos casos em que a anestesia usada foi a raqueana, quando a diferença de tempo é apenas ligeiramente mais elevada. Isso se compreende porque o cirurgião só emprega a raqueana em tais casos si lhe parece tratar-se de um tumor movel, de extirpação presumivelmente facil. E mesmo assim, em geral ele procura trabalhar depressa, temente de que termine a ação anestésica antes que esteja finda a intervenção. São esses os motivos porque a raqueanestesia pura nos deu um tempo operatório excelente e praticamente igual para qualquer indicação da ressecção gástrica.

Depois da raqueanestesia, a geral por inalação foi a que forneceu melhor tempo nas operações por câncer, seguindo-se lhe a anestesia local, mesmo assim com a média relativamente boa de quasi 1 hora e 35 minutos. Nos casos mais dificeis, em que a raqueanestesia não foi suficiente e houve a necessidade de se associar uma anestesia complementar, a média de cinco casos abeirou-se das 2 horas. No que respeita ao câncer, esta estatística, embora pequena, apresenta a particularidade de consignar um numero aproximado de casos para cada tipo de anestesia, pois que foram feitas:

Com anestesia local	38 casos
Com anestesia geral	33 casos
E com anestesia raqueana	29 casos
Total	100 casos

Passemos agora a analisar os numeros relativos ás intervenções em indivíduos não cancerosos.

Conforme o tipo de anestesia, estão assim divididas:

	nº	%
Sob anestesia local	583	45,62
Sob anestesia raqueana	435	34,03
Sob anestesia geral	260	20,35
	1 278	100,00

Essa porcentagem não exprime a tendência atual do Serviço. Com os progressos da anestesia geral por inalação em circuito fechado, associada ao uso do oxigenio e do curare, temos dado preferência, ultimamente, a esse tipo de anestesia, que nos permite trabalhar com sossego, sem o apressuramento que a raqueana nos impunha, apresentando, apezar disso, um tempo operatório que apenas ultrapassa de cerca de 7 minutos e meio o obtido com ela.

Abandonamos praticamente a anestesia local, não só por prolongar o áto cirúrgico, mas tambem por proporcionar maior incidência de complicações pulmonares posoperatórias e isso porque as picadas para a infiltração da parede despertam dores e forçam o doente a uma hipoventilação nas primeiras horas que se seguem ao efeito anestésico.

QUADRO II — *Gastroduodenectomia Parcial — O tempo operatorio na sequencia dos anos*

Ano	nº de oper	Câncer nº de casos	Câncer tempo médio em minutos	Outras indicações nº de casos	Outras indicações tempo medio em minutos
1935	32	2	118,0	30	96,3
1936	55	-	-	55	91,5
1937	61	3	94,0	58	86,7
1938	54	3	92,0	51	86,8
1939	49	1	104,0	48	88,8
1940	67	3	88,0	64	88,4
1941	63	8	104,6	55	84,1
1942	80	6	101,6	74	87,8
1943	126	10	87,1	116	74,8
1944	125	3	82,1	122	67,9
1945	100	6	63,2	94	61,7
1946	150	12	63,7	138	55,0
1947	107	8	87,6	99	63,9
1948	87	9	77,9	78	65,3
1949	133	18	85,0	115	67,4
1950	89	8	75,0	81	67,3
(até outubro)	1378	100		1278	

torio que es mecanismo del método esplacnoterápico; la misma curiosa pista ha servido a Hench, aconsejado por Kendall para experimentar una hormona cortico-suprarrenal, la 17 hidroxy-11 de hidrocorticostirona (llamado compuesto "E" o "Cortisona") y emplearla a muy fuertes dosis (por lo menos 100mlg. diarios). Los resultados sobre 16 P.C.E. fueron satisfactorios. En el VII Congreso Internacional de las enfermedades reumatismales (Nueva York 30 de mayo-3 de junio de 1949) presentaron una película magnifica. Desdichadamente la poliartritis se reconstituye en pocos días desde la cesación del tratamiento y además el compuesto no podrá producirse en cantidad appreciable antes de algún tiempo.

Estudiemos otra observación referida por el Dr. Philip S. Hench de la Sección de Medicina de la Clínica Mayo, en marzo de 1949; en su trabajo sobre "la capacidad de remisión de la artritis reumatoide" en cuya conclusión dice "la potencia curativa que parece dormir en cada paciente de esta enfermedad espera el estímulo superior del futuro" en uno de los párrafos del texto dice:

"En 1930 en la Clínica estudiamos la analgesia y el incremento circulatorio que sigue frecuentemente a la simpatectomía lumbar hecha para aliviar la artritis reumatoide de las extremidades inferiores. Pero como las extremidades superiores, cuyo sistema simpático estaba quirúrgicamente intacto, era frecuentemente aliviados casi tanto como las extremidades inferiores, concluímos que la anestesia general incidente al procedimiento operatorio. . . . era el común denominador."

Nos parece que esta observación fué una pista magnífica abandonada. A la luz de nuestras teorías haríamos la siguiente interpretación: la simpatectomía lumbar obra como tratamiento esplacnoterápico sobre las suprarrenales y funcionalmente al dolor generalizado al territorio del simpático. Ya hemos afirmado en nuestros trabajos de fisiopatología espláenica sobre su funcionamiento integral semejante a unidad, que combate el pesado prejuicio de exclusiva distribución sistematizada, creado por la idea preconcebida de analogía con los nervios de la vida de relación. También, como diferencia técnica, nosotros preferimos en general, en estos casos, la cirugía química a la cruenta por: menor agresividad, efecto en mayor superficie y volúmen, posibilidad de repetirlo o completarlo, mas rápida y mejor recuperación y menores complicaciones.

Con nuestra doctrina encontramos explicación sencilla y verosímil a muchas observaciones análogas que habían sido mal interpretadas que no hay lugar por ahora a analisar.

Otros padecimientos que se explican por deficiencia suprarrenal podrán tratarse: púrpura reumatoide, del que tenemos un caso muy demostrativo, (una Srita. que presentaba grandes placas faciales y de los pliegues articulares, que desaparecieron en 10 días); para la diabetes insípida tenemos anticipos pues por ejemplo Salmon dice "se ha notado la atenuación o desaparición de la poliuria después del bloqueo o la sección esplácnica"; hechos que ahora encuentran su explicación y base científica y que esperan confirmación estadística.

DISCUSION

Parece que hay suficientes argumentos para aceptar la hipótesis de insuficiencia suprarrenal como factor de la artritis reumatoide, hipótesis basada sobre todo en los trabajos de Hench y Kendall y que ha venido a comprobarse en otro aspecto al encontrarse que la simpatectomía o mejor el bloqueo simpático prolongado puede recuperar la víscera y lograr la curación de la artritis.

Siendo la artritis padecimiento hasta ahora misterioso y que ha curado por causas que no fueron explicables, podría ser que entre los casos observados por nosotros hubiera habido curaciones espontáneas, hecho que obliga a aumentar estadística. Entre los 68 casos observados por nosotros es probable que haya cierto número de padecimientos que no fueron artritis reumatoide porque en los períodos iniciales no puede hacerse el diagnóstico con certeza. En cambio es de demostración sencilla el alivio de los dolores y de la tumefacción articular que comienza pocos días después de la esplacnoterapia.

En el mejor de los casos cabe suponer que la esplacnoterapia podrá curar o mejorar aquellos padecimientos en los que no haya destrucción suprarrenal avanzada e incapacidad para recuperar casos muy graves en los que la "Cortisona" necesitaría suministrarse continuamente y casos límites o intermedios que la medicación y la recuperación podrian asociarse

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Editorial

Organized Effort

It was a great day in the history of the human race when man first learned to take counsel of his fellows. It was a greater day when there emerged from this experiment the power of "seeing double" in human relations, of realizing that there are two sides to every question and that it is not impossible for one's antagonist to have the right view of the matter.

Out of these early struggles toward an erect posture of man's soul came folk-sayings, proverbs and adages passed from neighbor to neighbor, friend to friend, tribe to tribe, village to village and nation to nation—at first by word of mouth and later by that further victory of intelligence over chaos, the printed word. Experience tried these principles and proved their worth, and they were passed down from generation to generation, until now they can be considered the common property of the race even down to the children.

We have all grown up on such sayings as "In union there is strength," "It takes two to make a quarrel," "Two heads are better than one" and a hundred others of like sort. They have become so familiar as to be almost inaudible. When we hear one of them nowadays, which of us pauses to think what a giant effort of the mind and will, what an upward straining of every faculty of man's groping intelligence must have been required to produce it? For there was a time when the whole of human destiny might have been summed up in the grim and graphic colloquial expression "dog eat dog." We have come a long way since then.

It is not good, however, to go too far on a dark and tortuous trail without pausing once in a while to glance behind us. To lose sight of the past is to lose perspective for the future. Nowadays, when organized effort in hundreds of fields is the accepted mode of procedure among men everywhere, we need occasionally to take a backward glance: to reexamine the principles on which those efforts are founded, and to note whether in the exuberance of our activities we have strayed, or are in danger of straying, off the trail.

Every institution, said Emerson, is but the lengthened shadow of one man. Behind every organized group is a vision of some good to be accomplished and of the banding together of many minds to achieve it. The results of cooperative endeavor are nothing short of stupendous. The originator of the idea is frequently lost sight of as time goes on, and is usually content so to be if his dream is being brought to realization. But no such dream can be realized if the original idea is lost; and it is well to remember that every truism about cooperative effort has, like a coin, its obverse side:

In union there is strength. Yes. But there can be strength for evil as well as for good.

United we stand, divided we fall. Yes. But it is better to fall than to shift our ground, if the ground was good and fairly won in the first place. One may recover from a tumble; but the habit of compromising with an ideal is metastatic and seldom curable.

Leadership in a great organization provides a man with an unparalleled opportunity to serve his fellows. Yes. But it also provides him with an unparalleled opportunity to serve himself. If a man in the position of a leader centers his ambitions wholly upon aggrandizement either of himself or of the organization, he can do harm. When the organization becomes more important than what it stands for, the result is corruption.

These facts are surely self-evident to any thinking man. They apply equally to organizations of scientists, educators, ecclesiastics, industrialists or artists. What every organization needs to become and remain vitally effective are dedicated leaders and a dedicated membership; leaders and members who hold it their highest duty in those capacities to keep perpetually before them, first of all, the principles upon which the organization is based.

The prosperity of the organization as such is important but it must take second place The aggrandizement of the individual leader or member is incidental Honest efforts are recognizable, after all, there is little danger that they will go unregarded Even if they did there are other and more suitable fields for personal ambition

The well established custom in scientific artistic and scholarly groups of conferring "fellowships" is more than a custom, and the word selected is more than a random appellation It expresses exactly the quality desired Fellowship signifies more than cooperation It signifies also good will, a generous attitude and a certain amount of humility It excludes self interest, self aggrandizement, and political maneuvering for place It implies first and foremost that the holder of the degree has been honored by his colleagues with the assumption that he is a first rate human being as well as a first rate professional man and that he can be relied upon to keep that distinction in mind and do nothing to besmirch it

Every member and every official of an organized group is in the position of a trustee, and the trust he guards is the organization s ideal Since (except in the case of open and flagrant transgression) no penalty can be attached to abuse of this fiduciary obligation, it becomes a matter of simple honor and decency not to abuse it

Fortunately those who do abuse it are rare, but the abuse of it by even one member, particularly a prominent member, can do untold harm In the first place, it creates confusion of purpose within the group and opens the door to fanaticism, which has been aptly defined as redoubling one's efforts after forgetting one s aim, in the second place, it creates suspicion and distrust of the organization in outsiders whose good will and cooperation are thereby lost Just in proportion to the growth and success of an organized group must its integrity be jealously watched and defended, lest its mighty strength be diverted from the channel

M T

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New Horizons

By the Editor

The Jenner Bicentenary

Two hundred years after the birth of Edward Jenner it is hard to realize, except in the academic sense, the change this single man has made in the world. Our forefathers had a more poignant realization of it—and with what good reason! In Iceland alone in the year 1707, eighteen thousand of a total population of fifty thousand died of smallpox. In 1796 the disease claimed the lives of thirty thousand Prussians. Six million died of it in Mexico. The total eighteenth century toll was about sixty million. Thomas Babington Macaulay, in his famous *History of England,* described its ravages in an unforgettable manner:

"Smallpox was then the most terrible of all the ministers of death. The havoc of the plague was far more rapid; but the plague visited our shores only once or twice within living memory; and the smallpox was always present, filling the churchyards with corpses, tormenting with constant fears all whom it had not yet stricken, leaving on the lives of those it spared the hideous traces of its power, turning the babe into a changeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to the lover."

Our own Thomas Jefferson wrote to Jenner: "You have erased from the calendar of human afflictions one of the greatest. Yours is the comfortable reflection that mankind can never forget that you have lived; future nations will know by history only that the loathsome smallpox ever existed, and by you has been extirpated."

Jefferson's prophecy has all but come true already. In a very genuine sense we now know of smallpox almost entirely as a matter of history. As yet, perhaps, we are in no danger of forgetting that Jenner existed; but he is, like all other great men, becoming dim in the distance, a figure of high and permanent tradition; in other words, a name. It is both moving and delightful to be reminded of his humanity; to be told of his delight in nature and poetry, and of the warmth, gentleness and lack of ostentation in his personality. The most callous among us can scarcely fail to feel a pang of guilt at the pathetic remark he made shortly before his death: "I am not surprised that men are not thankful to me" (imagine it!), "but I wonder that they are not grateful to God for the good which He has made me the instrument of conveying to my fellow-creatures."

These memorabilia are duly and beautifully brought to us in a pair of volumes recently issued. One of these, containing Jenner's own account of his investigations, is reviewed elsewhere in this issue of the *Journal.* The other, a memorial tribute by Nolie Mumey, published by the Range Press of Denver, Colorado, is entitled "Vaccination: Bicentenary of the Birth of Edward Jenner," and contains the quotations just given, as well as the inscription on Jenner's tomb:

> ". . . Let rescued infancy his worth proclaim,
> And lisp out blessings on his honor'd name;
> And radiant beauty drop one grateful tear,
> For beauty's truest friend lies buried here."

It contains, in addition, numerous portraits of the great discoverer, as well as an engraving of the vicarage in which he was born. Limited to a signed edition of two hundred copies, this little book is a treasure well worth cherishing. But with or without the book, no thoughtful man or woman can deny or wish to deny the individual debt every one of us owes to Edward Jenner. All honor to his memory, now and forever. The light he kindled, even dissolved as it now is in "the light of common day," is one that will never be quenched.

Chapter News

International College of Surgeons
United States Chapter

ARNOLD S JACKSON, M D, F A C S, F I C S, Secretary

Chicago Assembly At the Sixteenth Annual Assembly of the United States Chapter of the International College of Surgeons, to be held at the Palmer House in Chicago on September 10 13, 1951, a Scientific Exhibit of more than usual interest and value will be presented, exemplifying in concrete and visible form the tremendous strides recently taken in the development of medical and surgical equipment, facilities and literature Exhibitors who wish to participate are requested to communicate promptly with **Dr Arnold S Jackson**, Secretary, United States Chapter, 1516 Lake Shore Drive, Chicago 10, Illinois

Another outstanding feature will be a Cineclinic to usher in the outstanding Assembly program The Cineclinic will be held on the evening of Monday, September 10, with presentation in the form of motion pictures This method of illustration has already proved as valuable as it is up to date, and the Cineclinic should not be missed by anyone attending the Assembly Further details may be obtained from Dr Jackson at the aforementioned address

A formal announcement of the Chicago Assembly appears elsewhere in this issue of the *Journal*

The general program is nearing completion The large group of outstanding surgeons who will participate assures another splendid assembly As an attendance of 3 000, or more, is anticipated members of the College are advised to secure their hotel and banquet reservations now

Dr Chester W Trowbridge is again acting as Chairman of the Banquet Committee, and he announces that reservations will be available for only 1 300, of these 300 will be balcony seats

Atlanta Meeting Approximately 150 surgeons attended the Sectional Meeting of the International College of Surgeons, U S Chapter, held at the Atlanta Biltmore Hotel, Atlanta, on January 11, 12, and 13 Surgeons from the following states were in attendance Georgia, Alabama, Florida, Tennessee South Carolina and Mississippi

Drs William Perrin Nicolson and **T C Davison**, two of Atlanta's most distinguished surgeons were co chairmen of the meeting They were assisted by the following committees

Program Committee

B T Beasley, M D, *Chairman*
Exum Walker, M D
Wadley Glenn, M D
L Minor Blackford, M D

Entertainment Committee

Shelley Davis, M D, *Chairman*
B L Shackleford, M D
Lester Brown, M D,

Hotel and Assembly Committee

Harris Dew, M D, *Chairman*
H E Steadman, M D
L G Baggett, M D

Publicity Committee

A H Letton, M D, *Chairman*
Olin Cofer, M D
John Ivey, M D

Finance Committee

W W Daniel, M D, *Chairman*
James H Byram, M D
Harold McDonald, M D

Registration and Reception Committee

Spencer Kirkland, M D, *Chairman*
J B Avera, M D
L J Goodman, M D

Exhibits Committee

James H Byram, M D, *Chairman*
Frank Eskridge, M.D

Dr. Hal Davison, President of the Fulton County Medical Society, presided at the opening session, which was held Thursday evening at the Academy of Medicine. At this meeting **Dr. Laurence S. Fallis,** Detroit, gave a paper on "The Incidence of Marginal Ulceration after Gastrectomy in Patients With and Without Coincidental Vagotomy." **Dr. Raymond W. McNealy,** of Chicago, spoke on "Ulcerative Colitis—a Problem."

The Friday morning session, held at the Atlanta Biltmore Hotel, was opened by a paper by **Dr. C. D. Davis, Durham, N. C.,** "Male Pseudohermaphroditism: Some Endocrinologic and Psychosexual Aspects." An interesting paper by **Dr. Herbert Acuff,** of Knoxville, Tennessee, "Lesions of the Lower Esophagus and Cardiac End of the Stomach," was illustrated with some fine slides.

Dr. Amos R. Koontz, of Baltimore, spoke on "Tantalum Mesh in Hernia Repair" in a series of 147 cases. **Dr. Raymond McNealy** read a paper entitled "Trends in the Treatment of Carcinoma of the Left Colon" for **Dr. Karl A. Meyer** of Chicago, who was unable to attend. **Dr. Calvin Stewart,** of Atlanta, discussed "Cancer of the Mouth," illustrating his talk with some excellent Kodachrome slides.

An excellent paper on "Postoperative Abdominal Wound Dehiscence," based on a series of 515 cases, by **Dr. Harry E. Bacon** and **Dr. Howard D. Trimpi** of Philadelphia was presented by the latter. **Dr. Claude J. Hunt,** of Kansas City, gave an instructive discussion of the "Surgical Treatment of Cancer of the Colon," based on a study of 357 cases.

"Surgical Lesions of the Neck" was the title of a presentation by **Dr. Arnold S. Jackson** of Madison, Wisconsin, who emphasized the importance of early diagnosis and treatment.

Dr. Laurence S. Fallis, of Detroit, reviewed a series of 250 cases in his paper on "Acute Pancreatitis." **Dr. Irvin Abell,** of Louisville, reviewed a series of 345 cases to ascertain the "Early Symptoms of Late Carcinoma of the Colon." **Dr. Frank L. Meleney** of New York, spoke on "Further Experiences with Bacitracin in the Treatment of Surgical Infection."

Dr. Philip Thorek presented a fine paper, beautifully illustrated by slides, on "Recent Trends in Esophageal Surgery." An interesting discussion on "Tumors of the Ovary: Endocrinal and Other Rare Ovarian Tumors" was presented by **Dr. Gilbert F. Douglas,** of Birmingham, recently elected Chairman of the Section on Gynecology and Obstetrics of the International College of Surgeons, U. S. Chapter. "The Diagnosis and Surgical Treatment of Cervical Intervertebral Disc Lesions" was the subject of a splendid paper by Dr. Exum Walker, Atlanta.

Panel discussions of all papers were conducted by **Drs. W. W. Daniel** and **A. H. Letton,** of Atlanta. After the Thursday session, a cocktail party was given at the Biltmore Hotel for the surgeons and their wives, followed by dinner at the various clubs. This meeting was one of the finest sectional sessions ever given by the College and was a real stimulus to the development of the organization in the Southeast.

A Georgia Chapter was organized at a luncheon meeting, attended by 40 surgeons. **Dr. W. Perrin Nicolson** was elected president; **Dr. Ben T. Beasley,** vice-president, and **Dr. A. H. Letton,** secretary. In 1952 the Southeastern Sectional Meeting will be held at Birmingham.

Sectional Meetings: Plans are now well formulated for Sectional Meetings to be held in various parts of the country during the spring and summer months. Those seeking information on these meetings are requested to write to Miss Alma D. Case, Executive Secretary, at the Chicago office, 1516 Lake Shore Drive, Chicago.

International Board of Occupational Surgery: At a recent meeting the Executive Council of the United States Chapter, International College of Surgeons, and the International Board of Trustees unanimously approved the formation of an International Board of Occupational Surgery, with **Dr. Frederick W. Slobe, F.A.C.S., F.I.C.S.,** as Chairman and **Dr. E. C. Holmblad, F.A.C.S.,** as Secretary. The need of such a Board has long been apparent. The surgery of occupational injury and disease, particularly the former, is a large and complicated field, and the issues appertaining thereto are subject to confusion. The principal aims of the new Board will be as follows:

1 To work toward elevated standards of practice in occupational surgery

2 To conserve the health and efficiency of the worker after recovery from occupational injury or illness

3 To obtain official recognition of occupational surgery as a specialty

4 To stimulate interest in this specialty among students as well as established surgeons

5 To cooperate in the establishment of facilities for graduate training in occupational surgery by means or residencies in hospitals affiliated with medical schools, or their equivalents

The creation of the International Board of Occupational Surgery is thoroughly in line with the general aims and purposes of the International College of Surgeons and should prove its practical value from the beginning Great progress can be made by enlisting the interest of young surgeons in training as well as by utilizing the wisdom, skill and judgment of the experienced surgeon Those who wish further information concerning the Board and its proposed activities may obtain it by writing to Dr Arnold S Jackson Secretary, United States Chapter, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10, Illinois

Recent Honors Dr James T Case, F A C S F I C S, Emeritus Professor of Radiology of Northwestern University, was awarded a gold medal by the Radiological Society of North America at its annual meeting in the Palmer House, Chicago, for distinguished achievements in the field

Mexican Chapter Prof Dr Manuel A Manzanilla, F I C S (Hon), Vice President of the International College of Surgeons, has been decorated by the Cuban Government with the Order of Honor Jose Marti

Prof Dr Ramon Osorio y Carvajal, F I C S, has been elected Vice President of the new Mexican Academy of the History of Medicine

German Chapter Prof Dr. A Lezius, F I C S, Head of the Department of Surgery, Universitats Klinik und Poliklinik, Hamburg, Germany, has received the Honorary Fellowship of the Societa Triveneta di Chirurgia of Padua

News from Paris Prof Dr Raymond Darget, Fellow of the International College of Surgeons and Professor of Urology, University of Bordeaux has been elected Vice President of the Urological Society of Paris and will preside at the Congress of Urology, to be held in Paris in October 1951 Prof Darget cordially invites all Urologists and other interested surgeons to attend

Physicians of Northern England have formed a new organization which includes roughly the entire Northern Region of England The principal home of the Society is in Newcastle, but meetings will be held in other large towns of the Northern District The first program will be devoted to Professor Pybus' experimental work on carcinogenesis

The **International Society of Clinical Pathology** will convene in London July 16 to 20, 1951 An impressive meeting is in the making Those interested in presenting papers should address the secretary treasurer, **Dr. W. H. McMenemey,** Maida Vale Hospital for Nervous Diseases, London, W 9

New Books

An Inquiry Into the Causes and Effects of the Variolae and Vaccinae. By Edward Jenner. London: Sampson Low, 1949 (facsimile edition; original printing, 1798). Pp. 75, with 4 illustrations.

Edward Jenner's conscientious transcription of his study of the cause, effect and treatment of smallpox has been studiously reproduced from the most minute Jenner correction to the last flourish of Old English script. Aside from the historical significance of the work, it is interesting to accompany this great pioneer of medical science in his quest for meaningful facts in the solution of what during his lifetime was an almost totally unexplored problem.

After presenting the crucial statement that absorption of cowpox virus in the human system induces immunity against the infection, though to a variable degree, Jenner describes his methods of inoculation, supporting his belief in its efficacy by means of illustrative case studies.

The book's chief interest, aside from its value as a collector's item, is its intimate portrayal of an investigation which ultimately established a canon of medical practice. The peculiarly warm and individual flavor of Jenner's style stimulates interest in the discoverer himself. To the general reader as well as to the connoisseur of medical history this book has value, though naturally the impact of its initial introduction can no longer be felt.

Le Système Neurovasculaire. By Guy Lazorthes. Paris: Masson et Cie, 1950. Pp. 300, with 71 illustrations.

This is an original work on the neurovascular system. While the various questions germane to the subject are to be found in various journals dealing with anatomy, histology, physiology and biochemical and surgical aspects of diseases of the neurovascular system, there is no single volume which embodies all the phases pertaining to the neurovascular apparatus. To accomplish this was the aim of the author, and he has succeeded. He has garnered from the literature all that is known and augmented it by his own experiences. The work opens with the anatomic, histologic and physiologic aspects of the subject matter under discussion. The innervation of the vascular system is thoroughly investigated. This is followed by tracing the various nerve pathways from their center toward the periphery, thoroughly covering the paths of the vasomotor apparatus and those of vasosensibility. The second portion of the book is devoted to a study, region by region, of the neurovascular system. This is of particular value to surgeons and anatomists. The third and fourth sections, dealing with such functions as tonus, vasomotor reflexes and reactions to stimuli, physical examination of the neurocutaneous system, various pathologic entities of the vasomotor apparatus, vascular pains, etc., will be of particular interest to the neurologist anesthesiologist, the internist and the physiologist. The fifth section is devoted to neurovascular surgery, which will prove of particular value to the general surgeon and the neurosurgeon. The operative procedures as well as the preoperative and postoperative care, are lucidly described. The work is up to date and is a worthy contribution to contemporary surgical literature. The illustrations are explicit. The book can be highly recommended to anyone capable of reading French.

La Plesioroentgenterapia Dei Tumori Vescicali. By Pasquale Bruni. Naples: A. Caldarola, 1950.

The author of this fine, compact book, Prof. Bruni, is Chief of the Urological Service of the Tumor Institute at Naples. The major theme of the text concerns the treatment of tumors of the urinary bladder. Special emphasis is placed upon irradiation in the management of these lesions. The technical aspect of roentgen therapy is explained in detail. Dosage, tubes, duration of exposure, etc., are discussed at great length. Many illustrations of the radiation apparatus and tubes are included in the text. Other topics discussed are the tolerance of the patient to this form of therapy and the end results. As a whole, the book is an excellent text for urologists and roentgenologists, and, as such, it is highly recommended.

Congenital Anomalies of the Heart and Great Vessels: Clinicopathologic Study of 132 Cases. By Thomas J. Dry, Robert L. Parker, H. Milton Rogers, Jesse E. Edwards, Howard B. Burchell and Arthur H. Bulbulian. Springfield, Illinois: Charles C Thomas, 1948. Pp. 68, with 80 illustrations.

Closely adapted from a series of lectures given at a meeting of the American Medical Association, these studies of sixteen different anomalies of the heart and great vessels have been modified and some additions included. One addition is the inclusion of short quotations from forerunners in research preceding each case study. The selection of these quotations is based on their influence upon the authors of this text.

In presenting the study the authors have included, in addition to a great number of fine illustrations, a score of case histories listing the principal features of each anomaly and the incidence in each series. The purpose of the study is to correlate all past theory and clinical study with practical application in treatment of the diseases.

The irregularities presented here are those available in the authors' pathologic material. They include: cor biloculare, cor triloculare biatriatum, atresia of tricuspid orifice, atresia of mitral orifice, persistent common atrioventricular canal, atrial septal defect, ventricular septal defect, Eisenmenger complex, tetralogy of Fallot, complete transposition of the great vessels, persistent truncus arteriosus, patent ductus arteriosus, atresia of the aortic orifice, anomalous aorta and coarctation of the aorta.

Although no conclusions are drawn, these studies, as such, are highly informative.

Your Prostate Gland: Letters from a Surgeon to His Father. By Reed M. Nesbit. Springfield, Illinois: Charles C Thomas, 1950. Pp. 56, with 6 illustrations.

Acting on a tacit assumption that knowledge dispels fear, the author has written a series of letters about disturbances of the prostate gland, methods of examination and methods of treatment, including an explanation of the "open" and "closed" technics of resection. In consideration of the mental qualms accompanying such treatment, he has also discussed the probable results. The inquiry is terminated with a section on cancer of the prostate.

The discussion is intended as a lucid and nonacademic presentation for the layman who is interested in furthering his knowledge of prostatic afflictions. In this respect the author is highly successful. As the title indicates, the work is written in the form of a series of letters from a surgeon to his father. The letters, of which he mentions having kept copies although he never expected them to be read by anyone else, seem a little too well rehearsed for the casual type of letter usually written to one's father. Aside from the form, however, the book is a fine contribution as a nontechnical and informative study of great interest for the uninitiated.

Pathology in General Surgery. By Paul W. Schafer. Chicago: The University of Chicago Press, 1950. Pp. 580, with 495 illustrations (368 in color).

This large, exceedingly handsome and lavishly illustrated volume is a superb presentation of pathology from the clinician's point of view. Three hundred and sixty-eight—that is to say, the majority—of the illustrations are in full color. The added value appertaining to such illustrations in this particular field is almost inestimable. An unusual feature is the generous proportion of gross pathologic specimens reproduced in color, since the usual tendency is to concentrate heavily on the microscopic appearance. Plenty of photomicrographs, of course, are also presented.

Dr. Schafer's text is so planned as to illuminate and explain the organic systems concerned in each particular pathologic condition and to make these descriptions quickly available to the reader. Recent advances in the knowledge of neoplastic growths, both benign and malignant, are well covered.

Material from the Departments of Surgery, Radiology and Pathology of the University of Chicago Clinics furnishes the main basis of the work. The book has great value for the general practitioner as well as for the specialist.

Introduccion al Estudio de la Urologia. By Prof. Dr. A. de la Peña. Valencia: Medicina Española, 1950.

This is a compact work, comprising only 79 pages. It is an excellent study of urology both for the medical student and for the mature urologist. Those who are interested or intend to specialize in this branch of surgery will find, in perusing it, that there is much worth-while material to be gained. The author begins with an introduction of the concepts of urology, giving valuable material on the history of the specialty. This is followed by a description of the fundamentals essential to the acquisition of a thorough knowledge of the subject matter involved. Even the experienced urologist will find much worth-while material in the text, including selection of students, highlights in the preparation of scientific papers on urology, successful organization of didactic procedures, and effective conduct of classes. Those who read Spanish will find this work valuable and well worth while. It should be translated into other languages.

Anoxia, Its Effect on the Body. By Edward J. Van Liere. Chicago: University of Chicago Press, 1942; second impression, 1943.

This small volume is an excellent presentation of the physiologic aspects of anoxia. Many of the chapters are compilations of the author's previous experiments and publications. Other research students have added to current knowledge of anoxia by formulating premises founded upon some of the information emphasized in several of the chapters contained in this excellent treatise. Some reference is made to the work of Prof. A. Gemelli of Milan. This is an outstanding book, worthy of the attention of the research physiologist and the clinician.

Plastic and Reconstructive Surgery. By Ferris Smith. Philadelphia: W. B. Saunders Company, 1950. Pp. 895, with 592 illustrations.

This is a directive manual for skilled plastic surgeons. The author does not recommend its use by the inexperienced surgeon except under close supervision by an expert.

Special emphasis is placed on such developments, occurring within the period since World War I, as the use of the tubed pedicle and its conveyed flaps, the use of Indian forehead flaps in facial repair, and the popularization of the skin grafts of Thiersch, Reverdin and Wolfe.

The illustrations throughout are excellent and well explained, and those demonstrating end results of plastic correction are impressive. The plastic surgery of burns is exhaustively treated.

As is suitable to a book intended as a working manual, the material here is wholly factual and didactic, not literary. The book should be of great practical use not only to the practitioner but to the instructor in plastic surgery of the human body.

Cirugia Retropubica Urinaria. By Terence Millin. Spanish adaptation by Prof. Dr. Alfonso de la Peña. Madrid: Editorial Saturnino Calleja, S.A., 1950. 180 illustrations.

The works of Terence Millin in retropubic urinary surgery are very well known to the English speaking public, particularly those on retropubic prostatectomy. This translation of the original work from English into Spanish is exceptionally well done, and one who reads Spanish, whether he is a urologist or a general surgeon, will find it a welcome addition to his library. The author accomplished this translation under the direction and supervision of Terrence Millin. The material presented is thorough, the illustrations are excellent, the paper and printing of high grade. Particularly well chosen and well presented are the color plates. When one speaks of Millin one immediately connects his name with retropubic prostatic surgery, but this work also embraces other urologic subjects of interest. The greater part of the text is devoted to retropubic prostatectomy, but such subjects as prostatic carcinoma, calculosis of the prostate, carcinoma of the bladder, traumatic rupture of the posterior urethra, prostatic abscesses, etc., are also described.

Chirurgie Réparatrice et Correctrice des Téguments at des Formes. By L. Dufourmentel. Paris: Masson et Cie., 1950. 2d ed. aug. Pp. 400, with 457 illustrations.

The first edition of this work appeared in 1939. Since World War II, the specialty of reconstructive surgery subsequent to injury has gathered momentum. The author, a pioneer in this field, stresses the importance of reparative surgery from every point of view (functional, esthetic and economic). The present volume is brought up-to-date. Following the introduction, chapters on surgery of the tegumentary structures (nose, fronto-orbital region, jaws, ears, etc.) are given thorough consideration. The illustrations are good. Postoperative care, prosthesis and other matters germane to the subject are taken into consideration. A bibliography follows each chapter. The paper and printing are excellent. The work can be recommended for all interested in plastic and reconstructive surgery and for those who read French.

The **Fifth Peruvian Congress of Surgery** will be held in Arequipa, Peru, from March 25 to 29. 1951. under the presidency of **Dr. Amador Merino Reyna.** The themes to be discussed are the following:

1. Cesarean section
2. Acute cholecystitis
3. Compound fractures

For information. address **Dr. Ricardo Angulo,** Secretary of this Congress.

Abstracts from Current Literature

Diphtheria of the Granulating Wound, Its Treatment with Methylene Blue Melchior, E, Surgery 27 600, 1950

This author presents again his findings that pulverized methylene blue applied to diphtheria-infected granulating wounds will instigate a clearing up of the infection with subsequent healing of the wound An additional series of 10 cases is reported, in all of which a cure was accomplished Although diphtherial infection of superficial wounds is not common, it is occasionally encountered and has in the past presented quite a problem in therapy It seems as though in the light of failure of other methods, a trial of this method would be desirable

Harvey E Billig

Coarctation of the Aorta and Its Treatment. Burford, T H, Surg Clin North America 30 1249, 1950

Typically the coarctation segment is short and situated just distal to the ligamentum arteriosum and the left subclavian artery On rare occasions it may be found at lower levels, with coarctation occurring even in the thoracic aorta The constrictions involving the distal arch or the upper descending portion, or both, are of two types, the infantile and the adult They differ both anatomically and functionally and thus give rise to different clinical pictures In the *infantile* type (preductile), there is a large atretic segment in which the origins of the left subclavian and left common carotid are not infrequently involved, and the segment lies *proximal* to a patent ductus arteriosus This is a serious lesion and almost always leads to death during the first few weeks of life During this time there develops the picture of cardiac embarrassment and failure The blood pressure in the upper extremity is elevated, and no pressure can be obtained in the legs, the femoral pulse, however, can be readily obtained The presence of murmurs is of little help The lesion should be suspected in a noncyanotic infant with heart failure and who presents a higher blood pressure in the upper extremity than in the lower In the *adult* type (postductile), the narrowed segment is short This type lends itself more easily to surgical correction The complaints in this patient are variable They relate directly to the hypertension in the upper portion of the body and to a lesser degree to the decreased blood flow to the lower extremity Headaches are the most common complaint The physical signs make recognition fairly easy A difference in the blood pressure of upper and lower extremity is significant, if hypertensive in the arms and normotensive or hypotensive in the legs, the diagnosis is virtually established The presence of bruits or thrills in an abnormal area (due to collateral channels) should arouse suspicion Roentgenographic findings are notching of the inferior rib margins and lack of prominence of the aortic knob Retroarterial visualization results in diagnostic precision, and aortograms are suggested in all cases in which surgical intervention is contemplated

It is of interest to note that functionally these two types differ fundamentally In the infantile type with obstruction of the aortic isthmus the circulation distal to the obstruction is from the pulmonary artery by way of the patent ductus to the descending aorta, and thus there is no stimulus to the development of adequate collateral circulation In the adult type, on the other hand, even when the obstruction is complete the ductus goes on to obliteration and an enormous set of collateral channels develop, these collaterals are dependent chiefly upon the subclavian artery

The nature of the hypertension has had various explanations The author mentions the excellent article of Bing in this connection, and it was thus felt worth while to review the latter article Bing expressed the opinion that the hyptertension is not attributable to a renal pressor mechanism but is due to the resistance of the stenosis and the collaterals

Prognostically this is a serious disease, 40 per cent of the patients dying between the ages of 16 and 30 Degenerative changes in the proximal aorta and its branches are contributing causes, aneurysm, with rupture and particularly cerebrovascular hemorrhage, takes the highest toll

In suitable cases, operative treatment consists of resection of the constricted segment with end to end anastomosis The details, with illustrations, complete this article

Raymond Green

The Dumping Syndrome An Operation for Its Prevention. O'Neill, T, Brit M J 2 15, 1950

A high percentage of patients who have undergone gastrectomy or, less frequently, gastroenterostomy complain of weakness, occasional nausea and an unpleasant sense of warmth over the entire body shortly after taking food A cold sweat appears on the face, the heart rate becomes rapid and there is often a rise in blood pressure This condition is referred to as the dumping syndrome Many investigators have attempted to determine the cause of these symptoms. It is now generally considered that rapid emptying of the stomach and distention of the jejunum are the most significant factors.

The literature indicates that the dumping syndrome occurs in from 15 to 75 per cent of patients who have undergone partial gastrectomy. The author investigated 148 cases in which he had done partial gastrectomies. In the majority of these he had carried out the Hoffmeister-Finsterer procedure. On only 3 patients was the Polya method used; in all of them the dumping syndrome developed. The incidence of the dumping syndrome was 20.9 per cent in the entire series. It is generally believed that when the entire width of the sectioned stomach is used in the gastrojejunal anastomosis, as in the Polya operation, the symptoms are much more likely to occur than when the stoma is made smaller.

The author expresses the opinion that the valve produced by the Hoffmeister procedure tends to prevent the flow of bile into the stomach and to forestall the retrograde passage of food into the duodenum, and also results in the passage of material from the stomach into the jejunum in a less precipitate manner.

A method of anastomosis is described by the author, in which the stoma occupies the middle of the cut end of the stomach. This results in a valve above the stoma, as in the Hoffmeister procedure, and also one below. It is believed that the lower valve is more important and that it prevents food from passing from the esophagus to the jejunum without a preliminary period of retention in the stomach.

Forty-eight patients have been investigated after undergoing anastomosis by the author's method. None had severe symptoms; 1 had an occasional attack of weakness about two hours after meals; 1 had slight attacks of indigestion after breakfast, and another had a sensation of fulness after a large meal.

J. O. MORGAN

Annular Pancreas. Ohlmacher, A. P., and Marshall, E. A., Am. J. Surg. 79:473, 1950.

Fewer than 60 cases of annular pancreas have been reported. Ohlmacher and Marshall's patient is the thirteenth to invite and the ninth to survive surgical management.

This rare developmental error is presumed to be the product of failure of fusion between the ventral and dorsal pancreatic anlagen. It produces symptoms when the constricting effect is sufficient to obstruct the duodenum or the common bile duct.

Up to the present, only Lehman has been able to make even one exact properative diagnosis, in the case of a 23-year-old man. Two 3-day-old patients are numbered among the surgically treated 13. Both survived after posterior gastroenterostomy in the one who had also duodenal atresia, and duodenojejunostomy in the other.

No case has been reported of the survival of an infant with annular pancreas associated with jaundice. Choledochoenteroanastomosis would appear to be the procedure necessary to bypass the obstruction under such circumstances.

For relief of the duodenal obstruction it seems that duodenojejunostomy is the procedure of choice during infancy, while partial gastroduodenal resection with gastrojejunostomy is given primary consideration for complicated cases of annular pancreas occurring in adults.

On the basis of the very small series of collected cases, resection or simple division of the ring of pancreatic tissue was not satisfactory. All 4 patients so treated survived, but temporary pancreatic drainage and a tendency to persistence of symptoms reduced the desirability of the procedure.

Posterior gastroenterostomy in 5 cases was unaccountably distinguished by 4 fatalities. Although these cases were reported in 1906, 1928, 1930 and 1931, the authors have introduced this evidence as an argument favoring the more radical partial gastrectomy, although theoretically a simple gastroenterostomy should be relatively satisfactory in relieving this unusual condition.

THOMAS WILENSKY

Repair of the Collateral Ligaments of the Knee. McConville, B. E., Surg., Gynec. and Obst. 90: 291, 1950.

This brief survey summarizes the pertinent points and the basic orthopedic considerations that apply to this type of injury. It is maintained that the majority of injuries to the collateral ligaments will respond to conservative cast treatment. It is believed that the technic of McMurray and Phillips for repair of the medial ligament, employing the uninterrupted tendon, is the procedure of choice, whereas repair of the lateral ligament with the iliotibial band gives the greatest benefit. It has been seen that occasionally the lateral instability of the knee joint is partially due to a rent in the fibrous capsule of the knee joint and that the lateral ligament is only partially torn. A careful repair of both the lateral ligament and the fibrous capsule will give good stability. A No. 0 zytor suture is employed. An imbrication of the iliotibial tract increases stability when the capsule ligament has been stretched or frayed. Sixteen repairs of collateral ligaments have been performed—10 in which the lateral ligament alone and 6 in which the medial ligament was involved. Recovery was complete, a stable joint resulting.

HARVEY E. BILLIG, JR.

Cor Triloculare Biatrium. Shechter, F R, and Greenspan, H S J A M A 144 100, 1950

Cor triloculare biatrium is a rare congenital anomaly representing but 2 7 per cent of patients with congenital cardiac anomalies Cor triloculare is a three chambered heart, consisting either of 2 atria and 1 ventricle and called cor triloculare biatrium, or consisting of 2 ventricles and 1 atrium and called cor triloculare biventriculare

Because of the rarity of this entity, the authors report their experience and cite the case history of a child aged twenty-two months who was operated upon They follow the criteria established by G O Favorite as necessary to establish the diagnosis These consist of (1) a common large ventricle receiving the auriculoventricular orifices and the orifice of one of the great vessels; (2) a defective interventricular septum, and (3) one of the great vessels leading into the rudimentary ventricle

The cardiac observations are variable The roentgenologic and fluoroscopic data, however, are important In the anteroposterior position there is marked dilatation of the pulmonary conus, in the left anterior oblique there is no such evidence, indicating that the exaggerated shadow in the region of the pulmonary segment is the rudimentary outlet chamber If the patient survives for several years, the heart enlarges and the apparent prominence of the pulmonary conus disappears The contour of the heart remains the same regardless of the position of the great vessels The hilar shadows differ according to their position If the pulmonary artery arises from the common ventricle there is an excessive blood supply to the lungs, producing severe pulmonary congestion If the pulmonary artery originates from the outlet chamber the hilar shadows may be decreased or absent If the aorta is located in the outlet chamber the aortic shadow is narrow, and the reverse is true if the aorta is located in the common ventricle In the latter case the heart simulates that associated with the tetralogy of Fallot The electrocardiogram is of little aid

RAYMOND GREEN

The Use of Decamethonium Bromide for the Production of Muscular Relaxation Harris, L C, Jr, and Dripps, R D Anesthesiology 11 215, 1950

A report of the results in 250 cases in which decamethonium bromide (syncurine) was used for muscle relaxation in conjunction with general anesthesia Decamethonium bromide is a synthetic agent prepared originally by the English and used by them in clinical anesthesia

Of these cases, decamethonium bromide produced satisfactory degrees of relaxation in all but 2 Of especial interest is the fact that there were no instances of bronchospasm or hypotension In comparison, d-tubocurarine will produce bronchospasm and hypotension due to its histamine like reactions Syncurine used in amounts sufficient to cause adequate relaxation caused definite respiratory depression This depression was directly related to the size of the dose

A single dose of decamethonium bromide acts rapidly, its effect reaching a maximum within three or four minutes, beginning to wear off in eight to ten minutes and completely disappearing in twenty to thirty minutes

There seems to be no drug that is of value as an antagonist for decamethonium bromide Should respiratory depression become too great, adequate ventilation with oxygen is the most satisfactory treatment

This synthetic agent, therefore, has the advantage of its lack of histamine reactions as compared to curare, with apparently the same relaxing power Also, its shorter period of action may have some advantage in allowing the patient to react more quickly from general anesthesia

VERNON N BALOVICH

Osteoid Osteoma. McKeever, F. M, West J. Surg, Gynec and Obst 58 213, 1950

A precise and careful description of osteoid osteoma is presented This lesion has been erroneously identified as sclerosing osteomyelitis and chronic periostitis with a bacterial origin Jeffe's investigation and report is duly mentioned by the author Pain is a prominent symptom and may be intermittent at the beginning but becomes constant thereafter. Weight loss is due to pain and loss of rest The physical signs are not important, but tenderness over the thickened area of the bone without redness is a consideration The roentgen radiopaque picture of a nodule surrounded by a radiolucent area and sclerosis of the bone with some periosteal proliferation is characteristic but comes on late in the progress of the lesion Overexposure may be necessary to bring out this nidus when there is considerable sclerosis

Pathologically the reddish brown granular lesion is surrounded by dense bone Microscopically the tumor is composed, on its periphery, of spindle cells forming a small amount of connective tissue, while the remainder is filled with islands of osteoid tissue As a rule no inflammation is present The surrounding dense bone resembles periosteal new bone lamellated in appearance.

Complete relief is obtained when the nidus is removed but it is not necessary to remove all of the dense bone.

ELIAS N. KAISER

Lateral Dislocation of the Subtaliod Joint. Lawson, R. S., Australia and New Zealand J. Surg. 19:259, 1950.

The author presents a complete case record and limits the rest of his paper to a discussion of the ligamentous supporting mechanism of the talus. His comment brings forth the variations which exist in a talocalcanean ligament and the lateral support to the talus as provided by the calcaneal tibial and the calcaneal fibular ligaments. The blood supply to the talus is assumed to be conveyed via the capsule of the ankle joint or by small branches of the anterior tibial artery entering the dorsal surface of the talus through the superior talonavicular ligament.

ELIAS N. KAISER

Reflex Sympathetic Dystrophy of the Upper Extremity (Hand-Shoulder Syndrome). Bayles, T. B.; Judson, W. E., and Potter, T. A.: J.A.M.A. 144:537, 1950.

The authors attempt to clear up confusion in the diagnosis of this syndrome. They present data on 17 patients, showing that a variety of stimuli, such as pain from the viscera, blood vessels, heart or musculoskeletal system may produce this neurovascular response. Stellate ganglion block of the afferent pain fibers or sympathectomy may arrest this abnormal physiologic condition.

CLAUDE M. WARREN

Puerperal Gangrene. Clain, A., and Nussbaum, L. L.: Lancet 2:290, 1950.

Gangrene associated with childbirth is a long-established though rare entity. The cause may be (*1*) arterial embolism, (*2*) arterial thrombosis, (*3*) arterial spasm secondary to thrombophlebitis, (*4*) venous thrombosis alone or (*5*) a combination of these.

Audier and Haimovici in 1938, in an excellent review of gangrene of venous origin, attributed wet gangrene in the puerperal period to venous occlusion and dry grangene to arterial occlusion. They pointed out that gangrene associated with thrombophlebitis may stimulate arterial embolism, and they described a triad of symptoms observed in these cases of venous gangrene; i.e., severe pain in the affected limb, rapidly developing cyanosis (phlegmasia caerulea dolens) and edema.

Arterial spasm secondary to thrombophlebitis is probably the cause in most cases at present. Thus the appearance of the triad of Audier and Haimovici should be the signal for energetic antispasmodic and anticoagulant therapy. Haimovici and Suffness (1948), however, in a discussion of gangrene of venous origin, expressed the opinion that arterial spasm plays a minor role in the causation and that the widespread venous thrombosis present prevents the venous return and there is thus a state of blood stasis with consequent tissue anoxia leading to gangrene. Sepsis and ergot now play a minor role in puerperal gangrene.

The authors present a case of puerperal gangrene due to arterial spasm secondary to thrombophlebitis. They note that phlegmasia alba dolens should be energetically treated, because it involves not only morbidity (i.e., chronic edema of the affected leg) but a local mortality (i.e., gangrene). In addition, they note that pulmonary embolism is associated with this type of case.

CHARLES C. ABBOTT

Hydatid Cyst of the Right Auricle with Metastatic Pulmonary Echinococcosis and Chronic Pulmonary Hydatidosis Causing a Parasitic Obstruction of the Left Pulmonary Artery and Its Branches. Plaggio, R. A.; Dubourdieu, J. J.; Dighiero, J.; Canabal, E. J., and Grosso, O. F.: Arch. Uruguayos de Med., Surg. y Especialidades 36:530, 1950.

This paper reports the case of a patient who had a hydatid cyst of the right auricle which ruptured into the auricular cavity and created different pulmonary and cardiovascular complications, the first of which was metastatic echinococcosis, whereas the latter complication produced a syndrome of long standing, suggestive of chronic hypertension of the lesser circulation, which resulted in cardiac insufficiency. It was reasoned that the mechanism involved in the cardiovascular complications took the following sequence: The hydatid cyst ruptured within the auricle, producing an obstruction of the left branch of the pulmonary artery. There developed an aneurysmal dilatation of the vessel which secondarily produced echinococcosis and an embolic process of hydatid cysts formation. These invaded the various branches of the pulmonary artery, creating chronic hypertension of the lesser circulation and finally a cor pulmonale of hydatid origin.

The hydatid obstruction was observed to be located in the left pulmonary artery and its divisional branches area. The right pulmonary artery and its branches were patent and void of any obstruction. This confirmed the possibility of chronic hypertension of the lesser circulation induced by prolonged obstruction of one of the two main branches of the pulmonary arteries.

This process created tremendous hypertrophy of the right ventricular walls equal in dimension to that of the left ventricle wall.

In the authors' opinion this is the first case of chronic cor pulmonale of hydatid origin with obstruction of the pulmonary artery to be diagnosed clinically and confirmed at operation.

Armamentarium

Surgical Scrub Soap: Huntington Laboratories, Inc., have announced that their product Hexachlorophene Germa-Medica, a liquid surgical scrub soap containing the unique new germicide hexachlorophene, has been accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

Hexachlorophene Germa Medica is the first antiseptic surgical soap to be accepted by the Association. It contains 1 per cent Hexachlorophene, the equivalent of 2½ per cent on the anhydrous soap basis. Huntington reports, based on extensive laboratory testing and practical use in leading hospitals, claim that the antiseptic soap cleanses more thoroughly than the conventional scrub up. Less time is required, and the brush and germicidal rinses may be eliminated. Another advantage cited is the residual effect of the germicidal soap. The bacteria count remains at safe levels throughout the day when the soap is regularly used for all washes. No evidence of irritation has been reported.

A complete technical report of independent research findings on the use and effectiveness of Hexachlorophene Germa Medica may be obtained by writing to Hospital Division, Huntington Laboratories, Inc., Huntington, Indiana.

Surgical Sutures in Glass: In response to requests from many hospitals for D&G surgical sutures in glass jars, Davis & Geck, Inc., a subsidiary of American Cyanamid Company, has made all the popular products available in a new, attractive glass jar. D&G sutures in glass jars are carried in stock and are available for immediate shipment.

Although the hospital and the surgeon are primarily interested in the quality of the sutures rather than in the actual physical packaging, the glass jar offers advantages, the most notable of which is its transparency. The contents of the jar are visible at all times so that sutures may be reordered before they are completely used up.

Many operating room nurses have long been accustomed to the use of glass containers for storing sutures and prefer them. Chrome plated covers are supplied free of charge with the initial order.

Water Filter: The LaMotte Filtr-Ion, a low cost, disposable unit for small scale production of chemically pure water for use in general scientific work, has been made available by the LaMotte Chemical Products Company of Baltimore. It is said to deliver neutral (pH 7) water free of mineral ions and is recommended for the preparation of reagent solutions.

Scaling Unit: The Nuclear Instrument and Chemical Corporation of Chicago offers the Count-O-Matic Scaling Unit, a "complete packaged counting system" with scaling units for every type of radiation counting. The scaler, it is claimed, can be set to count automatically a predetermined number of counts and indicate, on an attached electric timer, the time required to register the pre-set number of columns. Information and catalog can be obtained from the manufacturers, whose address is 237 West Erie Street, Chicago 10.

Institute of Industrial Health: General Motors, in collaboration with the University of Michigan, is establishing The Institute of Industrial Health at Ann Arbor, Mich., whose broad objectives will be research, education and service in industrial medicine, health and safety.

The long-range research project will be administered by a board to be appointed by University of Michigan Regents.

Scheduled for expansion in the Institute's program is GM's pioneering cooperative program between the Corporation and the nation's medical schools, whereby graduates from these schools interested in industrial medicine are able to take their in plant training in GM plants. The Institute will provide fellowships, scholarships and hospital residences in Industrial Medicine, Health and Safety.

Expanded Facilities: The American Cyanamid Company has announced construction of a 100,000 square foot building in Chicago's Addison Kimball District, which will be leased to this chemical firm. The building will contain 80,000 square feet of warehouse space on the first floor and 20,000 square feet of air-conditioned offices on the second floor. Additional land at the site affords an expansion potential should it be required at a later date.

Among the units of the Company which will use the new facilities are Calco Chemical Division's Dyestuffs Department, Pigment Department and Bulk Pharmaceutical Department, The Industrial Chemicals Division, The Agricultural Chemicals Division, The Plastics and Resins Division, The Explosives Department and Lederle Laboratories Division's branch office, local sales office, and Animal Nutrition Department.

American Cyanamid Company is the fourth largest chemical manufacturing concern in America, and serves over two hundred industries with more than five thousand items. It is believed by Company officials that service to its Midwestern customers will be materially improved by the new consolidated facilities.

In Memoriam

WILLIAM EARL SMITH

M.D., F.A.C.S., F.I.C.S.

William Earl Smith died on June 22, 1950 at the age of 65. Born in Manistee, Michigan, Dr. Smith received his medical degree at the University of Michigan. He did postgraduate studies in Vienna, New York and Chicago, and served his interneship and hospital residencies in New York at the New York City Hospital and the Kings County Hospital, respectively. For many years he had been affiliated with the Stamford Hospital and the Saint Joseph's Hospital, both of Stamford, Connecticut, as attending surgeon. His practice was devoted entirely to general surgery. Dr Smith was a member of the American Medical Association, the American College of Surgeons, the Stamford Medical Society, the Fairfield County Medical Society, the Connecticut State Society, the New York City Hospital Alumni Society, and the International College of Surgeons. Dr. Smith held an enviable reputation in his community both for his surgical skill and for his high ethical standards.

WALTER RICHARD GRIESS

M.D., F.A.C.S., F.I.C.S.

Recently Dr. Walter Richard Griess of Cincinnati, Ohio, passed away at the age of 74 after a long and active practice. Dr. Griess studied at the University of Cincinnati Medical Department and the Cincinnati College of Pharmacy, doing postgraduate work at the University of Berlin. After serving as resident physician at the Cincinnati General Hospital for four and one-half years he was, at various periods, a Member of the Staff of St. Mary's Hospital, Deaconness Hospital and Bethesda Hospital, and for many years was Director of Surgical Service at the Children's Hospital. In addition to positions on hospital staffs, Dr. Griess was Consulting Surgeon for the Baltimore and Ohio Railroad and the C & O Railroad and was Chief Medical Officer of the Cincinnati Union Terminal Company. His practice was devoted almost exclusively to general and orthopedic surgery. Teaching positions, either as lecturer or instructor, were held at the following institutions: the Miami Medical College, the Laura Memorial College and the Ohio Miami Medical College (Department of the University of Cincinnati). He resigned the latter post to become a trustee of the University of Cincinnati. Dr. Griess also lectured for years at and later became dean of the Cincinnati College of Pharmacy and Biochemistry.

In addition to membership in the International College of Surgeons, Dr. Griess was a member of the American Medical Association, the American College of Surgeons, the Society for the Study of Internal Secretions, the Cincinnati Research Society and the Cincinnati Academy of Medicine.

JOHN HOWARD GARBERSON

M.D., F.A.C.S., F.I.C.S.

On August 9, 1950, Dr. John Howard Garberson of the Garberson Clinic of Miles City, Montana, died at the age of 67. A native of Iowa, Dr Garberson received his preliminary education in Alta, Iowa and his B.Sc. degree from Iowa State. In 1907 he graduated from the Northwestern University Medical School and began his internship at the Cook County Hospital in Chicago. A a postgraduate student Dr. Garberson was associated for several years with various clinics of the United States and Europe. Subsequent to this he served as surgeon and consultant at the Holy Rosary Hospital and the Garberson Clinic, both of Miles City, Montana. He was also for many years District Surgeon with the Chicago, Milwaukee & St. Paul Railroad. In a teaching capacity, he was Instructor of Surgery at the Holy Rosary Hospital School for Nurses. With the United States Medical Reserve Corp., Dr. Garberson held the rank of Major. His practice was devoted exclusively to general surgery.

Dr. Garberson was a member of the following Medical and Surgical Societies: the American Medical Association, the American College of Surgeons, the Eastern Montana Medical Association, the American Board of Surgery, the Montana Medical Association (Past President), and the International College of Surgeons. He was also a member of the Montana State Board of Medical Examiners.

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UNITED STATES CHAPTER

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CALENDAR OF MEETINGS

May, 1951

21-25............Société Internationale de chirurgie orthopédique et de traumatologie
Stockholm
Dr. J. Delchef
34, rue Montoyer, Brussels

July, 1951

International Society of Blood Transfusion
London
Centre national de Transfusion sanguine
M. Bernard Rouzet
6, rue Alexandre Cabanel, Paris

16-21.............Joint Meeting, British Medical Association and Medical Association of South Africa
Johannesburg, South Africa
H. Moross, General Secretary
5 Esselen Street, Johannesburg, South Africa

September, 1951

3-7...............International Anesthesia Research Society
London
Mr. R. W. Cope
University College Hospital, W C 1
London, England

10-13.............United States Chapter, International College of Surgeons
Palmer House, Chicago
Dr. Arnold S. Jackson
1516 Lake Shore Drive, Chicago 10, Illinois

October, 1951

1-6...............Congrès de l'Association française de Chirurgie
Paris
Prof. Brocque
12, rue de Seine, Paris 6ème

Congrès francais d'Oto-Rhino-Laryngologie
Paris
Dr. H. Guillon
6, avenue MacMahon, Paris

December, 1951

American Medical Association Clinical Session
Dr. George F. Lull
535 North Dearborn St., Chicago 10, Illinois

COLLEGE INTERNATIONAL DES CHIRURGIENS
GENEVE 35
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International College of Surgeons

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Vol XV MARCH, 1951 No 3

Original Articles

Surgical Management of Conditions and Diseases Affecting the Liver

HERBERT ACUFF, M D, F A C S, F I C S
KNOXVILLE TENNESSEE

THE liver is perhaps the one remaining organ of any magnitude in the body which has not been completely mastered by the surgeon It is wise to evaluate consistently the present knowledge of surgical diseases and conditions of the liver and explore the possibilities of still greater surgical potentialities in diseases that affect the liver (Fig 1)

Abscess—Two types of abscess encountered in the liver will be discussed, namely, amebic and pyogenic

It is difficult to conceive of two infectious processes involving the same organ and yet being so widely different For the one—amebic abscess—the treatment is simple and the prognosis excellent, while for pyogenic abscess in the liver the treatment is most difficult and the prognosis grave

Amebic abscess results from direct infection with Entamoeba histolytica, which passes from the colon along the portal vein into the liver, where the infection seems to produce a liquefaction type of necrosis in the hepatic cells, resulting in abscess formation

Although the amebic infestation is present in 5 to 20 per cent of the population of the United States, it is observed involving the liver in only about 5 per cent of the cases It is significant that in one-third of the cases of liver involvement from E histolytica the issue is fatal It is of value to know that this disease is seen most often in white men between the ages of 25 to 50 who have lived in the tropics

The abscesses may be multiple but are single in 70 per cent of the cases, and 85 per cent occur in the superior and posterior portions of the right lobe of the liver, presumably because blood from the intestine goes to the right side of the liver Multiple smaller abscesses tend to coalesce into a larger single abscess [illegible]mation, often reaching a [illegible]

Read at the Fifteenth Annual Assembly of the United States Chapter, International College of Surgeons, Nov [illegible] 1950

Submitted for publication Nov 27, 1950

to 20 cm. In a patient who is known to have amebic dysentery the abscess is recognized by the presence of fever, pain and tenderness over the liver area. Or, if the patient is not a known carrier, the presence of these symptoms, supplemented by rigor, rigidity over the upper right quadrant of the abdomen, right shoulder girdle and right iliac fossa, pain, enlargement of the liver, basal lung signs, sweating and a sallow complexion, are corroborative.

The white blood cell count is elevated, although polymorphonuclears are not increased in direct ratio. Roentgenograms taken in the anteroposterior and lateral views are decidedly accurate in confirming the diagnosis of liver abscess; fluoroscopic screening will show fixation of the diaphragm. The sigmoidoscope must always be tried for diagnosis and often gives valuable information as to the presence of the organism.

The complications of the abscess are of major significance so far as the mortality and morbidity factors are concerned. Ochsner and DeBakey (*Surgery* 13, 1943) collected 2,490 cases and noted pulmonary complications in 15.8 per cent. The abscess takes the route of least resistance and proximity and may rupture into the bronchus and be coughed up by the patient as chocolate-colored sputum; it may rupture into the pericardium, the stomach, the duodenum, the peritoneal cavity or the ascending or transverse colon. If no early rupture of the abscess occurs, it may completely destroy the right lobe of the liver (Fig. 2).

Treatment. — In any case in which

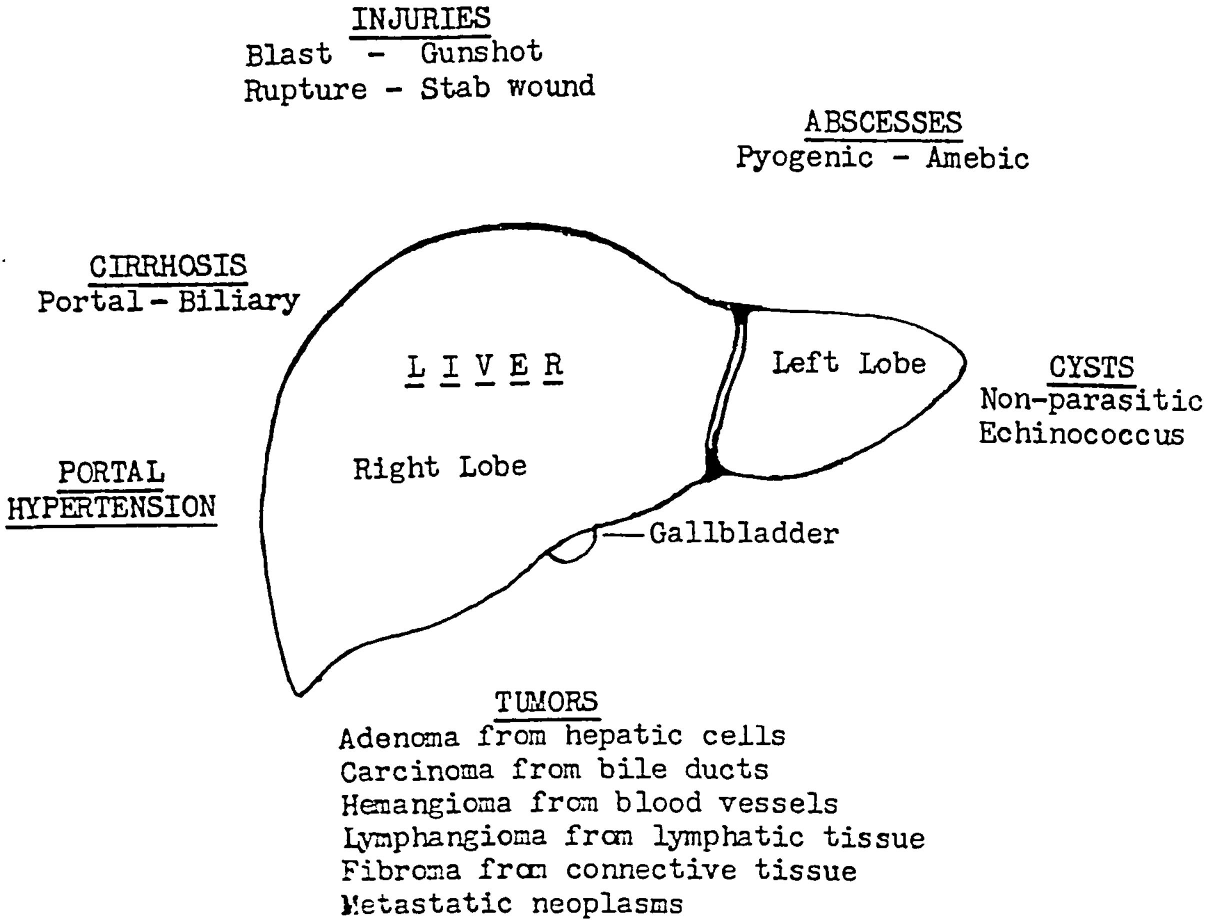


Fig. 1.—Outline of presentation.

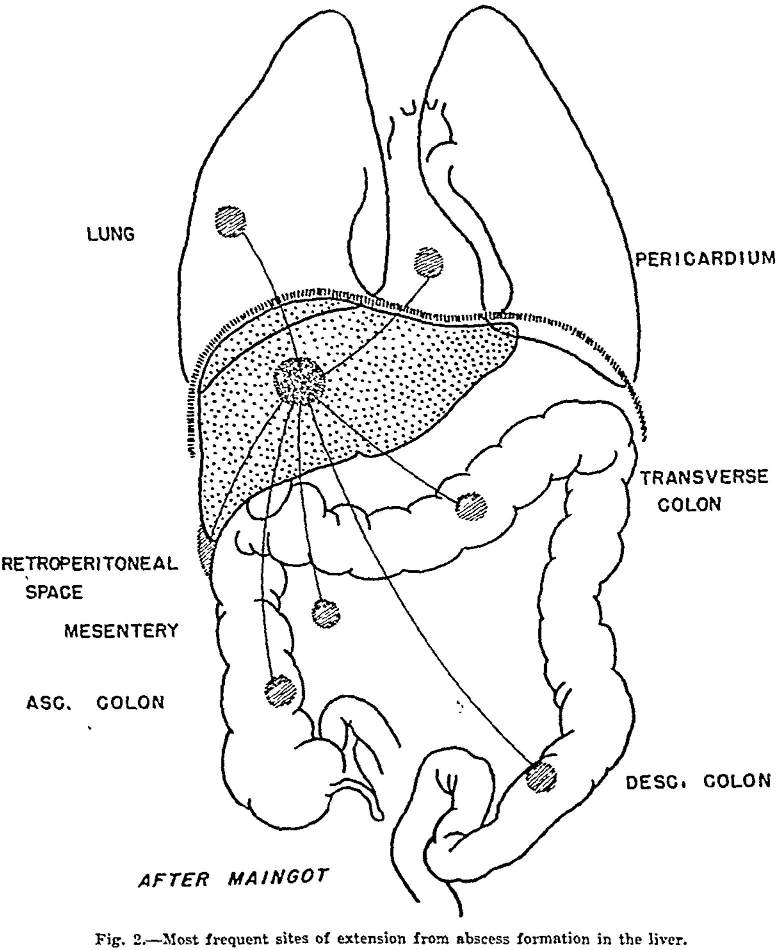


Fig. 2.—Most frequent sites of extension from abscess formation in the liver.

amebic dysentery is suspected, trials of emetine hydrochloride, 1 grain per day for ten days, must be given. If the diagnosis is confirmed, this medication is continued for three or more weeks. This drug acts as a specific in most cases. Emetine hydrochloride may also be followed by ½ grain of emetine bismuth iodide for ten successive days. Daily rectal retention enemas of 2.5 per cent of quinoxyl should be given concurrently with the aforementioned drugs. Even when abscess formation is present but very small, such a treatment is highly effective.

Carbasone given twice daily for eight days may well follow the aforementioned treatments. If these measures do not control the progress of the condition, aspiration of the abscess, with use of a trocar and a cannula, is indicated and is much to be preferred to external drainage. The abscess having been localized by physical signs and roentgen study, the most proximal route to the lesion should be used, and the needle inserted to a depth of not more than 3 to 3½ inches (7.5 to 8.8 cm.) for fear of entering the major blood vessels. The direction should be always inward and upward. The particular blood vessel to guard against in aspiration is the vena cava (Fig. 3).

Usually the aspirated pus is sterile or almost sterile, but if it is found to be teeming with pyogenic organisms, open operation is necessary for adequate drainage. The infected zone should be packed off carefully in order to prevent involvement of the peritoneal cavity.

One of the favorite approaches, because of the usual location of the abscess, is posteriorly in the seventh or eighth interspace. A portion of the overlying rib is resected, the capsule of the liver is stitched to the parietes, and after incision a large drainage tube is inserted. Since this point of election is on the posterior portion of the right lobe, drainage may be done with relative impunity. It is possible to lower the incision to the twelfth rib, push the pleura upward and enter the liver abscess extraperitoneally. After the cavity has been aspirated, the instillation of some 50,000 to 100,000 units of penicillin with appropriate sulfonamide therapy is of value.

Aspiration of a liver abscess is not an office procedure. The patient should be hospitalized and appropriate supportive treatment given before the operation and after. The after-treatment should consist of a full course of emetine and colon enemas of 2.5 per cent quinoxyl.

Pyogenic Abscess.—These abscesses enter the liver by the portal vein from infection in some area drained by the portal system. They also come by the hepatic arteries, as in cases of septicemia, furunculosis or appendicitis, and by direct extension from diseases of the gallbladder or from perforated wounds of the liver. The microorganisms observed usually consist of the colon groups—streptococci and staphylococci, pneumococci, Alcaligenes faecalis, clostridium perfringens, typhoid bacilli, etc. It is generally agreed that in 50 per cent of the cases these abscesses arise from acute suppurative appendicitis followed by pylephlebitis, which latter arises in inflammation of the ileocolic veins.

The location of the pyogenic abscess in the liver depends upon the route of the infection. If it is by continuity, it may be located anywhere in the liver; if it travels by the hepatic arteries or the biliary tree, the infection will be diffuse; if by the portal vein, it will depend upon the location of the primary lesion. If the superior mesenteric vein is at fault, the right lobe of the liver will be more affected, while if the area drained is by the inferior mesenteric vein, the left lobe will be involved.

The disease is approximately three times more common in the male than in the female, and the greatest per cent is found in persons between 30 and 40 years of age. Usually the abscesses are single, but they may be multiple, rarely reaching 1 cm. in diameter. The symptoms here are those of chills, fever, marked tenderness over the liver, atelectatic signs in the bases of the right lung and, usually, jaundice. It should be mentioned in passing that pylephlebitis is one of the first things to be considered if a septic temperature and rigors are noted among the complications in operations for appendicitis, hemorrhoids, etc. Certainly hemorrhoids should never be operated upon when they are in the acute, inflamed stage.

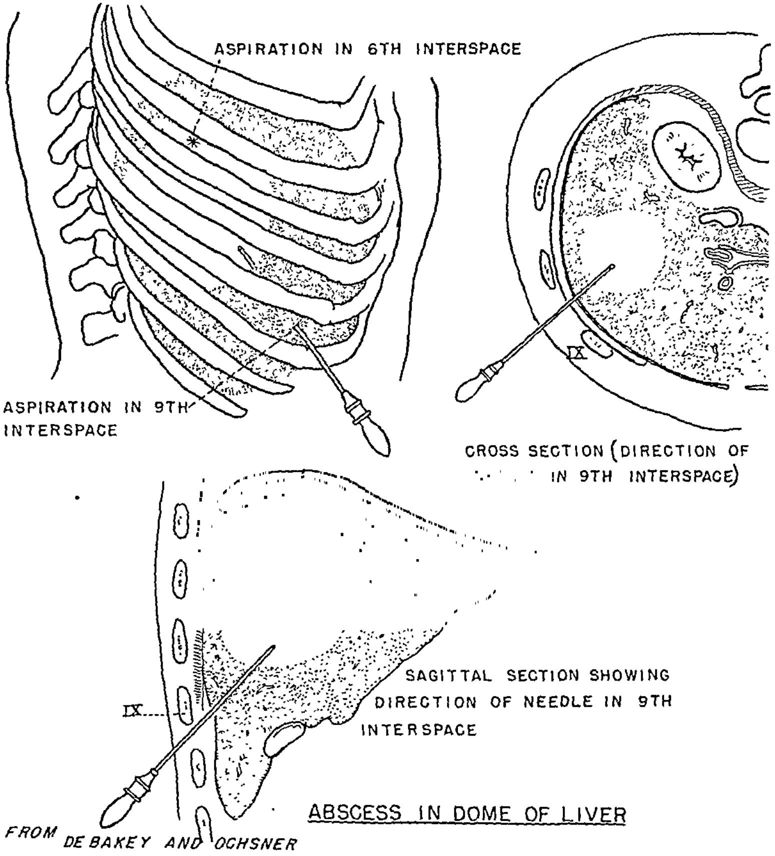

ASPIRATION IN 6TH INTERSPACE
ASPIRATION IN 9TH INTERSPACE
IX
CROSS SECTION (DIRECTION OF
IN 9TH INTERSPACE)
IX
SAGITTAL SECTION SHOWING DIRECTION OF NEEDLE IN 9TH INTERSPACE
ABSCESS IN DOME OF LIVER
FROM DE BAKEY AND OCHSNER

Fig. 3.—Technic of aspiration.

Prior to the day of antibiotics the mortality rose as high as 50 per cent in cases of single pyogenic abscess of the liver, and if there was extensive involvement of the liver, the mortality was 90 to 100 per cent. The prognosis is exceedingly grave in the presence of multiple abscesses. The most common complications of the abscess are rupture into the pleural cavity or into the lung, thrombosis, embolism and general septicemia.

Cysts of the Liver.—These are noted principally in two forms—echinococcus cysts and nonparasitic cys he ococcus cysts are also known as hydatid cysts and may occur in numerous places throughout the body, particularly the mesentery, the retroperitoneum, the liver and the lungs. The liver, however, is the most common site, with 74 per cent of hydatid manifestations appearing therein. The infection enters the liver through the radicals of the portal vein. Dogs are the chief cause of hydatid disease in human beings, becoming infected themselves by feeding on the offal of infested sheep, cattle and the like.

Hydatid cysts, when seen in the liver, have two distinct layers. There is the adventitia, which is made up of fibrous tissue, the result of the liver's reaction to the parasite, and the laminated membrane formed of the parasite itself. A fluid accumulates which registers a specific gravity of 1.005 to 1.01. It does not contain albumin, but has occasional traces of sugar and appears as a gray liquid. These cysts grow very slowly and often do not produce symptoms for a number of years. As a rule they are painless, and often the first symptom that presents itself is the swelling of the upper right portion of the abdomen which is often mistaken for hypertrophic cirrhosis or malignant tumor. About the only diagnosic sign obtained from the blood count in these cases is the marked eosinophilia. Casoni has described an intradermal test, comparable to the tuberculin reaction, for which 95 per cent accuracy in the diagnosis of hydatid disease is claimed.

So long as the parasite lives within the capsule or within the cyst wall, the cyst continues to grow. If the parasite dies, the fluid is absorbed, and all that remains are encapsulated, laminated bile-stained membranes such as are occasionally observed at necropsy. Usually, however, the cyst enlarges gradually and becomes manifest by the presence of a definite mass. These cysts oftentimes grow to enormous proportions and rupture into the intrabiliary tissues, where they cause suppuration and may rupture into the thoracic cavity.

Without the onset of complications, the morbidity is indeed surprisingly low. The complications occur as rupture into the peritoneal cavity, the alimentary canal, the biliary channels or the pleural cavity. If rupture occurs into the peritoneum, it is accompanied by all the signs of general peritonitis and must be treated rapidly and effectively, as in the case of peritonitis elsewhere.

Although these cysts are usually single, they are multiple in about 25 per cent of the cases. Treatment of hydatid cysts of the liver is definitely surgical. No drug has been identified which has the slightest effect upon the course of hydatid cyst formation.

The incision is made at the most dominant part of the enlarged right upper quadrant of the abdomen. The peritoneal cavity must be carefully and completely packed off as far as possible. If the cyst is projecting, it should be aspirated. If the cyst can be cleanly enucleated, the cavity in the liver may be closed completely. If the cyst is large, it should be packed and no attempt made to remove the adventitia. Every attempt must be made to prevent loss of the cystic contents into the peritoneal cavity. The sacs within these cysts are troublesome surgical complications, because they usually contain large veins and the hemorrhage is difficult to control. If the cyst wall is clean as in a simple cyst, with no biliary evidence visible, the cavity may be packed with a sulfanomide, a drainage tube placed to the suture line, the adventitia sutured lightly to the peritoneal suture line and the cavity left to heal in this manner.

Nonparasitic Cysts: Nonparasitic cysts of the liver may be single or multiple. Their origin is somewhat bizarre; they are known as congenital cysts, possibly arising from some local obstruction of the biliary tract, inflammation of the biliary ducts and neoplasm situated within the liver.

The incidence of cystic disease of the liver is about 0.17 per cent of all cases coming to autopsy. It is seen more often in male patients, in the ratio of 3 to 1, and although it may occur early it usually

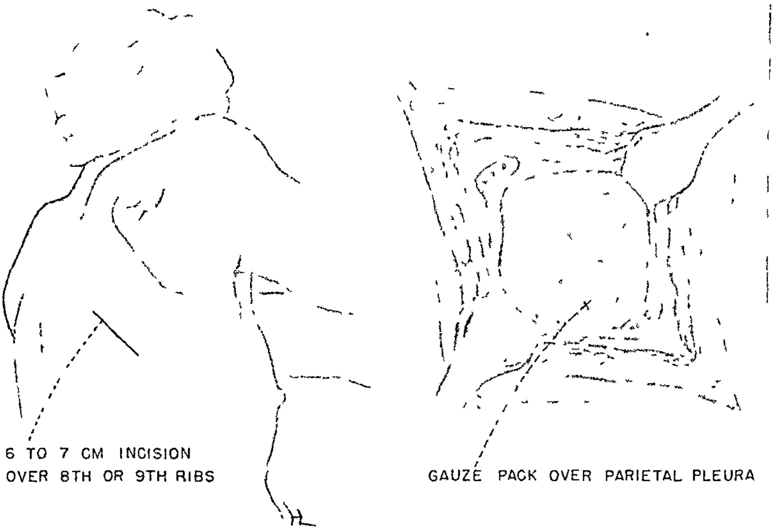


Fig. 4—Open method of treatment of abscess in the liver if closed method has been unsuccessful

does not manifest itself until the third and fourth decades of life. These cysts do not give symptoms until and unless they grow large enough to produce pressure. They then carry with them the symptoms incident to the organ upon which they encroach; namely, the stomach, the gallbladder or the liver.

Cysts often rupture and cause chemical peritonitis Upon examination of the liver, many times the surface is enlarged, but if the lesions are central, they are perhaps not noticed. If the lesions are situated superficially, the walls are thin and may be straw-colored or bluish. When aspirated, the content is usually clear liquid, but occasionally shows some chocolate color, suggesting previous hemorrhage. In lesions of this type, presenting no symptoms, perhaps the better part of wisdom would suggest leaving them alone; but if symptoms are present, surgical removal is necessary, and for the smaller ones only incision and drainage. If the cyst protrudes to the surface of the liver and appears to arise from a deeper portion of the organ, incision should be made down to the base of the cyst, thorough precautions being taken for hemostasis and the cyst removed in its entirety.

For a better control of hemorrhage, it is my custom in all operations upon the liver to use gelfoam freely against the margins of the cut surface of the liver, holding same in position for one or two minutes and then, when the deeper sutures are tied, tying a roll of gelfoam rather than a piece of gauze over the suture line.

NEOPLASMS OF THE LIVER

Neoplasms which are of interest to the surgeon are adenoma arising from the hepatic cells, carcinoma from the bile ducts, cholangioma arising from blood vessels, and fibroma and fibrosarcoma arising from connective tissue. The four most important, however, are hemangioma, adenoma, primary carcinoma and metastatic neoplasms.

Hemangiomas are somewhat rare, but when they occur they are seen more often in the liver than in any other internal organ. They often appear as small single or multiple lesions situated just beneath the capsule of the liver. They present a red, purple or spongy appearance and are usually 1 to 2 cm. in diameter. The symptoms consist of a mass in the epigastrium with some enlargement of the abdomen, nausea, vomiting and loss of appetite.

The most common type of benign tumor of the liver is adenoma. This may occur at any age and is usually discovered by examination of the liver at operation for some other condition. Some authors have stated that adenoma of the liver occurs as a reparative process of cirrhosis of the liver. Still others claim that it is a destructive process following such diseases as syphilis, malaria and sepsis.

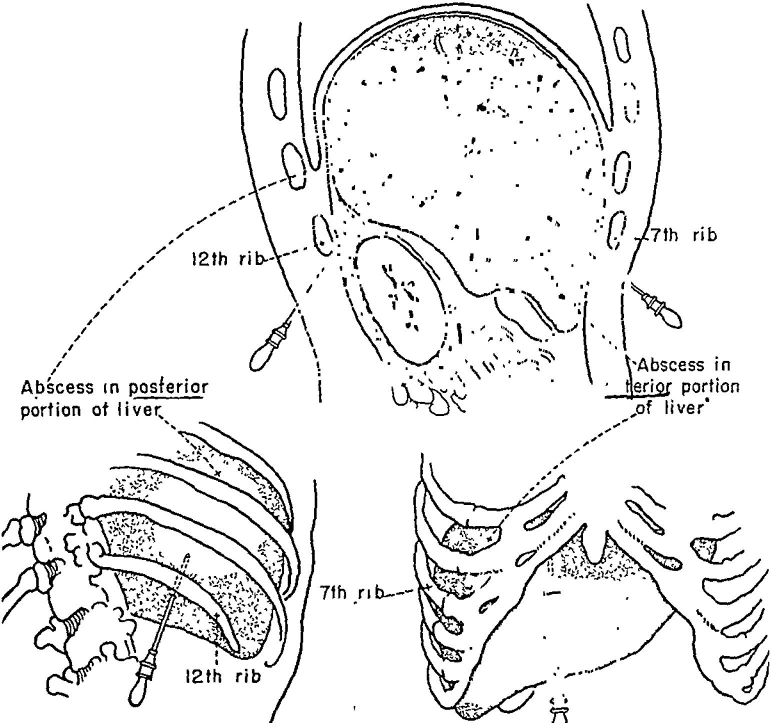
The symptoms may consist of some dull pain in the back or shoulder, jaundice, fever and occasional chills, with much flatulence and obstructive symptoms referable to the pyloric end of the stomach. If the adenoma becomes cystic and large and somewhat pedunculated, it may be confused with an ovarian cyst. Such an adenoma should be removed through a wedge-shaped resection with approximation of the liver edges, after preliminary placement of a so-called hemostatic cradle of deep sutures which are passed outside and around the tumor and which can be closed promptly upon excision of the growth.

Primary carcinoma of the liver is rare, accounting perhaps for 0.5 to 1 per cent of all cancers observed at autopsy. Ninety-eight per cent of carcinomas of the liver are secondary or metastatic. In cases of primary carcinoma the growth is usually nodular and at first somewhat resembles cirrhosis.

If a diagnosis of primary carcinoma of the liver is made, should an attempt be made to remove it? If the condition is localized, found early, and if it is situated in the left lobe of the liver, I would strongly urge that it be resected. The operation itself is best done through the wedge-shaped incision. U-shaped sutures should be placed at least ½ inch (1.2 cm.) distal to the line of excision and approximately ½ inch apart. After the growth has been excised, the resulting raw surfaces should be approximated by mattress sutures. If the tumor is solitary, it is particularly prone to remain localized, and therefore can and should be removed surgically.

Reports of the literature indicate that in 40 per cent of such cases the patient has lived from three to seven years after the operation. If one is so fortunate as to find the primary carcinoma located in the left lobe of the liver, resection of the entire lobe is feasible and is the proper procedure. Here it would seem that division of the liver tissue by means of a cautery or an endotherm knife would insure less bleeding. The hepatic artery and the portal vein, which are situated in the free edges of the gastrohepatic omentum, may be compressed by the assistant during the operation. Mattress sutures, perhaps using the wider fascial suture, are used after ligatures have been placed around all visible blood vessels. Gelfoam is placed on the margin of the raw surface of the liver.

What can be said of secondary metastatic lesions of the liver? They usually react in the liver from primary lesions in the stomach, colon, esophagus, pancreas and, less often, the breasts and the lungs. They involve the liver by the blood stream, through the lymphatics or by direct continuity. They are usually multiple and do not appear with regularity at any one part of the liver. As a rule they appear as sharply circumscribed, grayish-white, firm umbilicated lesions. In my opinion if the metastatic lesion is single, if it has followed surgical removal of lesions in the stomach or the colon, and particularly if it is situated toward the periphery of either lobe of the liver, one is justified in removing that lesion. There are numerous cases on record in



REDRAWN FROM OCHSNER AND DE BAKEY

Fig. 5.—Abscess of the liver.

which patients lived for five to seven years after the primary lesion was removed, and surgical removal of such a lesion certainly would not be contraindicated.

In multiple metastatic lesions of the liver, certainly no form of surgical intervention is indicated, and to a less extent is roentgen therapy indicated.

Subdiaphragmatic Abscess.—This condition is most usually a postoperative complication of abdominal operations for appendicitis, peptic ulcer, perforation and resection of the gastrointestinal tract, and operations for gunshot, stab and other severe traumatic wounds to the liver.

Subphrenic abscess should be suspected when symptoms of toxemia are noted in the patient after operation for any of the above-named conditions in the abdomen. Such symptoms are sweating, loss of appetite, epigastric fullness, discomfort, pain in the shoulder and anemia.

The infection is seen under the diaphragm, along and in direct contact with one or more surfaces of the liver. A cut redrawn from Adams (*Surgical Clinics*, June 1948, p. 636) shows the paths of infection leading to the under surface of the liver from the various known sources of infection in the abdomen.

It must be remembered that there are seven spaces in the area of the liver in which accumulations of pus may occur—three of which are on either side and one in the center of the body. This is due to the arrangement of the peritoneum in this area. Localizing signs, then, may be looked for in any one of these spaces, each of which may present a different chain of signs and symptoms. If the abscess points anteriorly, there will be tenderness and rigidity with swelling ranging laterally and posteriorly. There may be signs of pleurisy, with diminished breath sounds and limitation of respiratory excursion due to pain. Leukocytosis is present and relatively high.

The roentgen ray is of paramount value in making an accurate diagnosis, and here, the position of the patient during roentgen examination is of maximum importance. An anteroposterior film should be taken with the patient in the upright position, the same view with the patient lying on the unaffected side and the third view taken laterally with the patient sitting up. A combination of these views will demonstrate the gas pockets beneath the diaphragm, which are caused by certain bacteria, such as the colon bacillus, producing gas within the abscess and thus resulting in the characteristic roentgen picture. There is fixation of the diaphragm on fluoroscopic examination. Aspiration

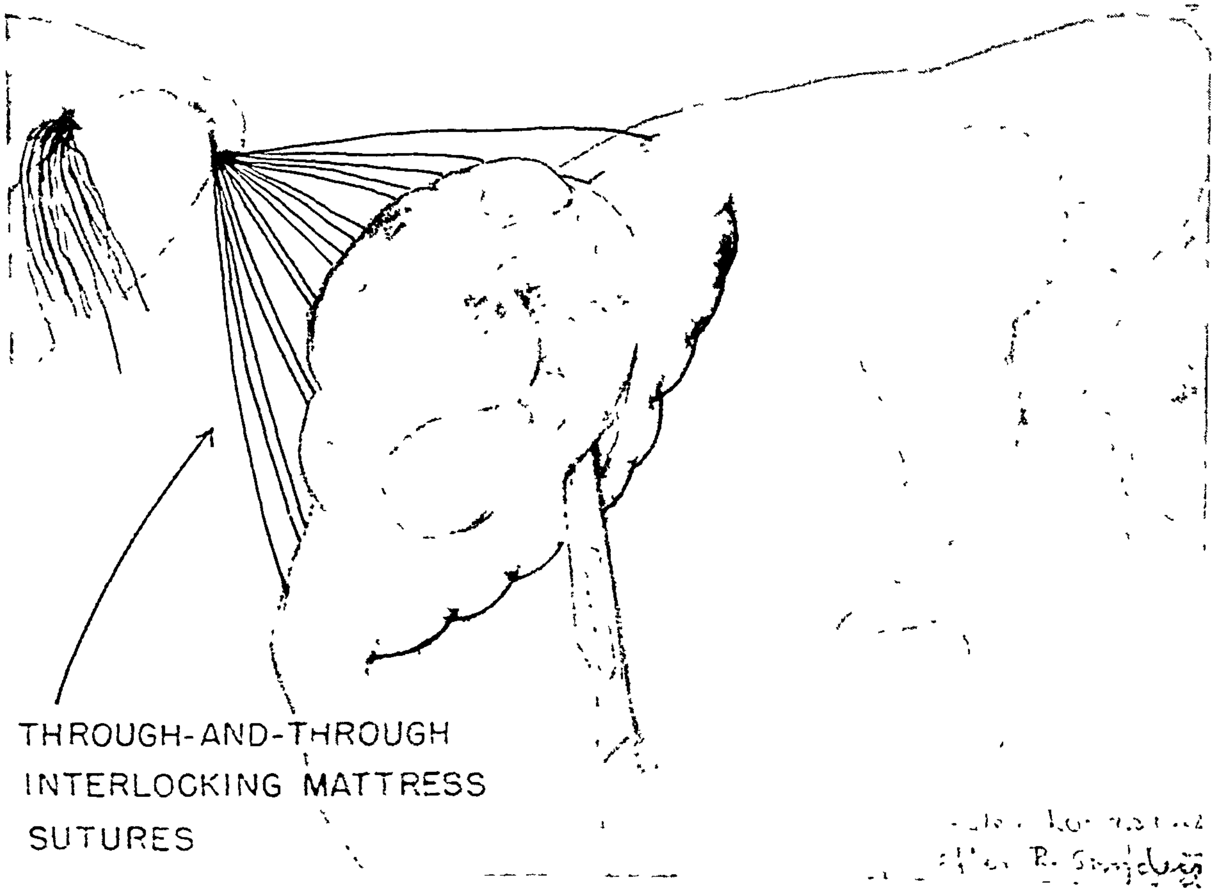


Fig. 6.—Cysts of the liver.

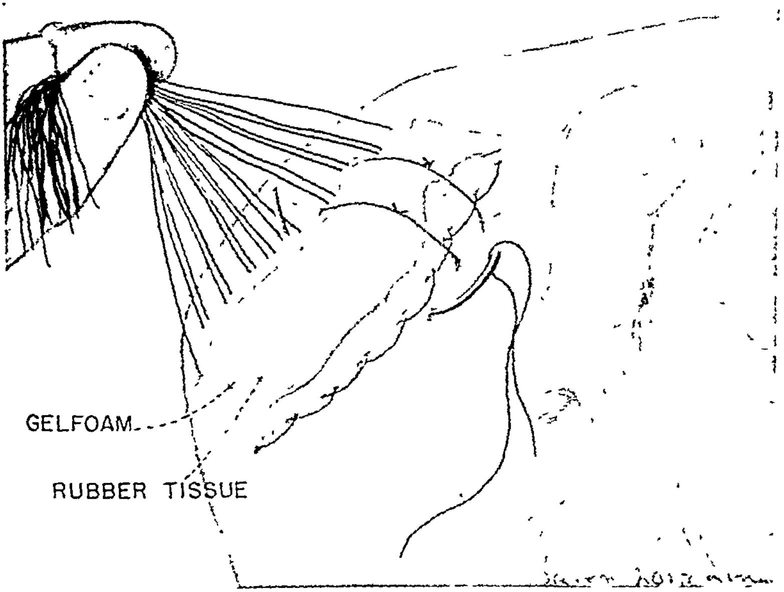


Fig. 7.—Control of hemorrhage by gelfoam pack in wounds of the liver.

by a needle or small trocar is the final confirmation of diagnosis.

Treatment. In the treatment of this condition, the primary focus should, if possible, be localized; penicillin and sulfadiazine are administered freely, together with intravenous dextrose-saline combinations and blood transfusions to overcome the terrific toxicity. Streptomycin is of marked value as an antibiotic. If after a due length of time no improvement is noted, incision and drainage of the abscess must be done.

If the abscess is situated anteriorly in the right lobe of the liver, it may well be approached by the extraperitoneal route, and drainage effected by blunt dissection with the finger or some blunt instrument. If the abscess is situated posteriorly, the retroperitoneal approach is the method of choice.

Ochsner and Graves (*Ann. Surg.*, 1933) collected a series of cases in which transpleural drainage was employed with a mortality rate of 3 per cent. They reported 31 cases of drainage through a retroperitoneal approach, with a resulting mortality of 9.7 per cent. This approach is made through an incision over the twelfth rib, subperiosteal resection of the rib being done; the finger is introduced through the incision, mobilization of the parietal peritoneum from the undersurface of the diaphragm is performed and the liver abscess entered with a blunt instrument, drainage effected, the cavity injected with antiseptics and 50,000 to 100,000 units of penicillin instilled. A drainage tube is inserted, and the patient is given supportive treatment with numerous blood tran[illegible] ltiple vitamins and the administration of adequate amounts of dextrose.

Injuries to the Liver.—In injuries to the liver there are no definite signs to guide the surgeon, but the symptoms are those of hemoperitoneum, dullness (more pronounced on the right side), shock and evidence of blood loss, pallor and air hunger. The condition is serious and requires immediate surgical intervention. If the rupture is on the anterior or the superior surface, a mattress suture is much to be preferred and should be inserted with a blunt thin liver needle. The sutures should be placed in mattress fashion and should include the most dependent portion of the rent. Bleeding is the one troublesome and dangerous problem and, if copious, should be immediately controlled by placing the finger through the foramen of Winslow and compressing the portal vessels of the liver and duodenum between the finger and thumb. Electrocoagulation units are of great value, but visible bleeders should always be transfixed and tied. Gelfoam is placed in the wound, and the mattress sutures are tied taut but not tight enough to cut the friable liver tissue.

If the wound to the liver is extensive and is not accessible, packing, preferably with gelfoam or oxycel absorbable gauze, is the method of choice. This gauze rarely has to be removed, because it is absorbable. If nonabsorbable gauze packing is used, it should be removed gradually after it has been in situ for five days.

Kirschner has suggested the injection of 1:1,000 epinephrine solution into the liver to control bleeding. He uses 20 drops of 1:1,000 solution of epinephrine placed with 100 cc. of physiologic solution of sodium chloride and injects it freely at safe distances, 2 to 5 cm. away from the wound edge. This blanches the liver and helps markedly to control bleeding which has not previously been controlled by ligature or electrocoagulation.

I can recall in my own experience many gunshot wounds, stab wounds and traumatic rupture wounds of the liver which will show the ability of the liver to withstand surgical treatment.

REPORT OF CASES

CASE 1.—A soldier of World War I was brought into my hospital with a severe and extensive wound of the right side overlying the liver which resulted from a shrapnel explosive. The soldier was in extreme shock; hemorrhage was profuse, the blood pressure was 90 systolic and 60 diastolic, the pulse rate 140, the temperature 97 F. Air hunger, pallor and anxiety were all present and pronounced.

Shock treatment was instituted, and continuous plasma was given. Because of the urgent factor of hemorrhage, surgical intervention could not long be delayed. The wound was thoroughly débrided under local anesthesia, the macerated liver tissue was removed from the superior and lateral aspects of the right lobe of the liver, fully three-fourths of the right lobe being taken. Fortunately it was possible to spare the gallbladder and the structures of the porta hepatis.

Before débridement of the liver, through-and-through sutures of heavy catgut were placed 0.5 cm. apart, each overlapping the previous stitch; a wedge-shaped section was removed from the liver which permitted the edges to become better approximated, and interrupted segments of the rectus abdominalis muscle were placed in the open liver wound. The sutures, all being held, were quickly tied over a gauze pack which controlled the hemorrhage. Blood vessels, when visible, were tied individually. This patient later received whole blood. His convalescence was stormy, but he recovered, though with a complication of biliary fistula through the wound. This persisted for some three months, after which it completely closed.

In this case operation was not elective. It was an emergency; therefore, a more radical procedure was done than would be attempted in private practice. But the fact that this patient survived a removal of three-fourths of the right or large lobe of the liver should make the surgeon more intrepid in the practice of liver surgery.

CASE 2.—A white man aged 41 was injured by a large piece of timber sliding off the stack of lumber and striking him in the epigastrium. He went into immediate shock, with boardlike rigidity of the upper part of the abdomen, pallor, a weak, thready pulse beat (160 per minute) and a blood pressure of 70 systolic and 40 diastolic. The red blood cell count was 2,900,000 per cubic millimeter,

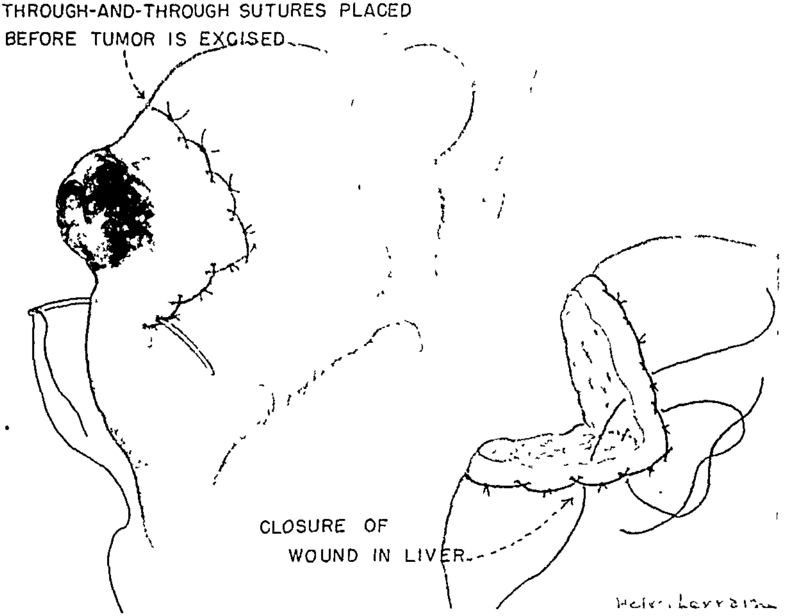

THROUGH-AND-THROUGH SUTURES PLACED BEFORE TUMOR IS EXCISED
CLOSURE OF WOUND IN LIVER

Fig. 8.—Neoplasm of the liver.

with 46 per cent hemoglobin. He was given continuous blood, oxygen by tent, coagulant therapy and plasma. After some two hours he reacted until he appeared reasonably safe for operative treatment.

When the abdomen was opened, a massive hemoperitoneum was encountered. Examination revealed the left lobe of the liver ruptured in many directions, with the outer edge of the left lobe completely detached. Practically the entire left lobe had to be excised. Both hemorrhage and bile were escaping profusely from the cut surface. Deep through-and-through wide fascia sutures were placed well back of the raw surface of the liver margin; two pads of compressed gelfoam were sutured against the raw wound, and the sutures were tied over gauze, which controlled the hemorrhage.

The patient was treated postoperatively with adequate dextrose, blood transfusions and a high protein diet. He has fully recovered and returned to work. He shows no evidence of liver deficiency.

Case 3.—On May 20, 1947, a physician, on leaving his office for the garage, encountered a marauder waiting to rob him. An altercation ensued, which resulted in the doctor's being shot at close range through the upper central portion of the liver. The wound of entrance was in front; the exit was slightly lateral and in the rear.

The physician was rushed immediately to the hospital. Blood typing was done, and he was prepared for immediate operation, all consuming less than forty-five minutes from the time of the accident to the time of operation. The cutaneous wound was enlarged; the liver showed a ragged, st [illegible] patt [illegible] injury with much devi [illegible]

There was a marked hemoperitoneum, and the escape of blood from the wound was terrific and alarming. Gauze packs were used, but pressure sufficient to control the hemorrhage was more destructive to the liver; therefore, deep sutures were quickly placed and a roll of gelfoam was placed into the wound, which extended the entire depth of the liver at the midportion of the right lobe. The sutures were tied, and after four or five minutes the hemorrhage was under control.

The wound was closed, a Penrose drain being left in situ. Multiple blood transfusions and the generous use of antibiotics were carried out. The patient made an uneventful recovery. Some six weeks later, at an office dressing, the roll of gelfoam was expressed from the wound only partially absorbed. The physician is now handling a heavy practice and shows no evidence of damage to the liver.

COMMENT

These 3 cases show three things: first, that larger amounts of liver tissue may be removed than has been formerly thought possible, with the remaining hepatic cells compensating for the loss; second, that although we have heretofore held the right lobe of the liver in greater respect, there seems to be little or no difference from which lobe the liver loss is sustained if the central vessels of the porta hepatis have been left intact; and third, the all-important factor of controlling hemorrhage immediately and adequately is emphasized. In the presence of this complication, deep overlocking sutures and gelfoam have been of the greatest value in my hands.

Cirrhosis.—Cirrhosis of the liver with ascites and portal hypertension has, until recent years, been considered a strictly medical problem; but since the incidence of cirrhosis has become greater, probably resulting from virus or infectious hepatitis, portal hypertension followed and has

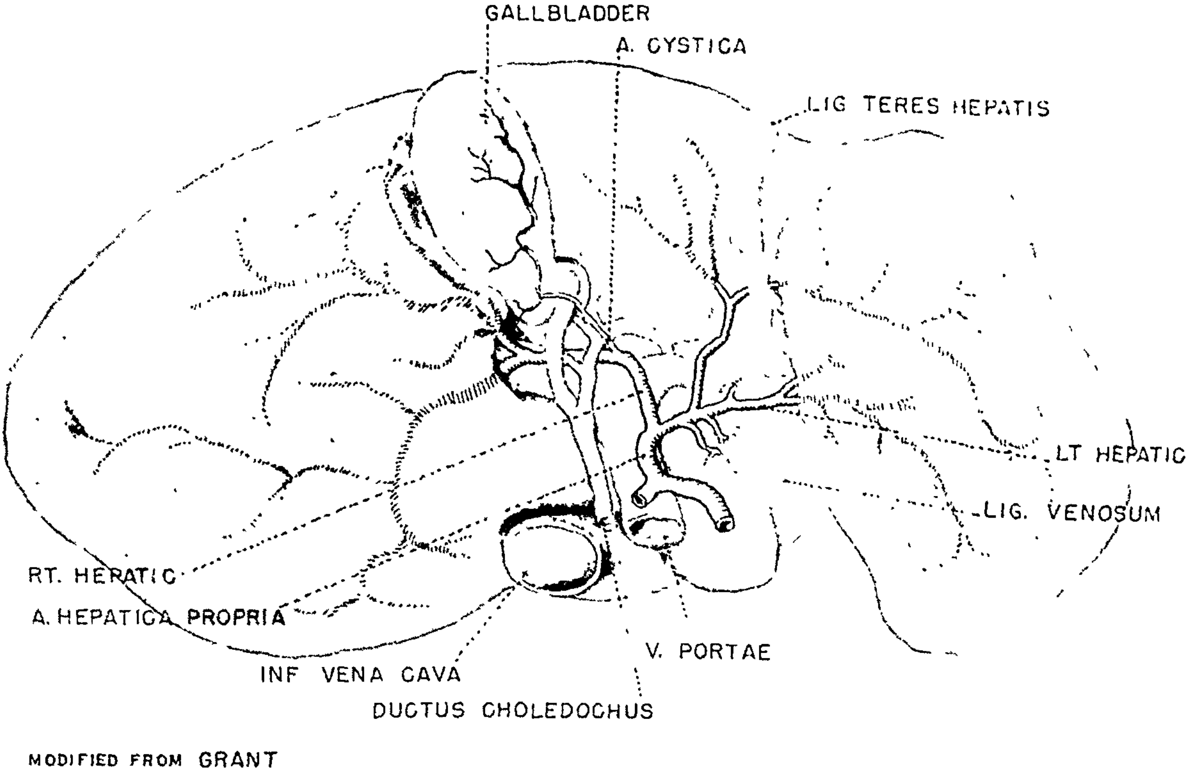


Fig. 9.—Excessive blood supply to be considered in surgical treatment of the liver.

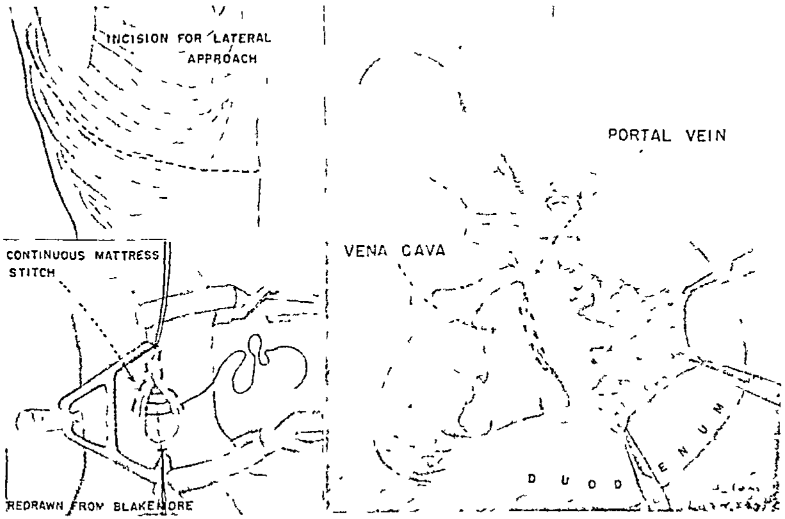


Fig 10 —Technic of portacaval anastomosis

shown marked amelioration to surgical procedures of anastomosing the portal and vena caval systems.

In the presence of extensive cirrhosis with marked portal bed block the portal system must find another route for adequate return circulation, which may be through the veins of the stomach, inosculating with the esophageal plexus and thus forming an auxiliary collateral circuit. In portal block the blood must of necessity travel under increased venous pressure, which results in submucosal varicosities, such as esophageal varices, gastric varices, hemorrhoids, congestive splenomegaly or subcutaneous varices, and later will follow the typical Banti's syndrome—leukopenia, thrombocytopenia and secondary anemia. The portacaval shunt procedure lowers the high pressure in the portal system; the varices disappear, and gastric and esophageal submucosal hemorrhage are reduced to a minimum.

Another procedure designed to lower portal pressure is one in which the splenic vein is anastomosed to the left renal vein in an end-to-side fashion. This is best done after splenectomy and is known as the splenorenal shunt. The operative approach for this procedure is on the left side. The tenth rib is resected and the left dome of the diaphragm split, while in the portacaval shunt the best approach is through a thoracoabdominal incision on the right side after removal of the tenth and probably the ninth rib.

The choice of procedure for cirrhosis of the liver is, in my opinion, portacaval shunt, because the vessels are larger and less friable and the postoperative lumens of the vessels are larger; therefore, recurrent hemorrhages and ascites are less frequent.

Splenorenal procedure is less difficult to perform, since fewer vital structures are encountered; however, the splenic vein is friable, tortuous and much smaller in diameter, and ascites and recurrent hemorrhages are more frequent than in the portacaval procedure. Occasionally atrophic and thrombotic changes are encountered in the portal vein which preclude anastomosis. In such a case one must be prepared to make a less desirable anastomosis with the superior mesenteric or other veins of smaller caliber. To justify portacaval shunt, portal hypertension of some magnitude is necessary, and most essential is the portal bed blocked by intrahepatic resistance or by extrahepatic obstruction.

Studies of the blood chemistry and liver function can be relied upon to diagnose cirrhosis of the liver, and if these tests give negative results one is fairly safe in assuming that the block is extrahepatic, the usual site being in the portal vein itself. In such a case the splenorenal procedure is best, provided the spleen has not been removed (this often renders the splenic vein undesirable for anastomosis).

Arthur Blakemore (*Southern Surgeon*, April 1950) summarizes his results as follows:

		Mortality
Portacaval	(25 cases)	12.5 per cent
Splenorenal	(66 cases)	17. per cent
Entire series	(91 cases)	15.5 per cent

Dr. Arthur Patek has reported 124 cases of cirrhosis of the liver in which medical treatment was employed, with complications of hematemesis in 44 cases, or 33 per cent. Twenty-two of the patients died from hemorrhages, and 50 per cent of the series died within one year. The report of such groups of cases leaves little question that we must look to surgery in the management of cirrhosis of the liver in order to prevent hemorrhage and abdominal ascites.

When, for obvious reasons, neither of the shunt procedures is deemed advisable, the patient should be given a trial with the Talma-Morison operation, which is designed to bring the omentum out of the peritoneal cavity and place it in a newly formed pocket, either between the peritoneum and the muscle or above the fascia. The omentum should be spread widely in its new environment, with interrupted sutures placed along the margins for fixation. The omentum may be divided if it seems necessary.

Three to six months are required for the collateral circulation to become sufficiently established to carry the ascites from the abdomen.

SUMMARY

Diseases and injuries of the liver are discussed in detail, including abscesses, cysts and neoplasms of various types; trauma of various types, and cirrhosis, on which special emphasis is placed. Three cases of trauma to the liver are reported to illustrate the ability of the liver to tolerate major surgical procedures.

In the section on cirrhosis the author stresses the fact that this condition is no longer considered a purely medical problem. Certain useful surgical procedures are outlined. The diagnostic importance of blood chemical studies and tests of liver function is also emphasized.

RÉSUMÉ

Les maladies et les traumatismes du foie sont étudiés dans le détail; on y rencontre aussi les abcès, les kystes, les cancers, les traumatismes et la cirrhose. On rapporte ici 3 cas de lésion traumatique, L'auteur, dans sa coupe sur la cirrhose, insiste pour traiter cette lésion autrement que par la médication seule. Il souligne plusieurs techniques chirurgicales très utiles; l'importance de l 'étude chimique du sang et des tests d'élimination du foie.

ZUSAMMENFASSUNG

Erkrankungen und Verletzungen der Leber einschliesslich Abszesse, Zysten, Geschwuelste, Gewalteinwirkungen und Zirrhose werden ausfuehrlich eroertert. Drei Faelle von Leberverletzungen werden mitgeteilt. In dem Abschnitt ueber Zirrhose betont der Verfasser, dass die Erkrankung nicht mehr ein rein medizin-

isches Problem ist. Gewisse wertvolle chirurgische Verfahren werden umrissen, und auf die Bedeutung der chemischen Blutuntersuchung und der Leberfunktionsproben wird hingewiesen.

RESUMEN

Se discuten circunstanciadamente enfermedades y lesiones hepáticas, incluyendo abscesos, quistes, neoplasmas, trauma y cirrosis. Se comunican 3 casos traumáticos. Se señala el hecho de que la cirrosis ya no se considera como problema puramente médico. Se exponen ciertos procedimientos quirúrgicos útiles y se puntualiza la importancia de la química sanguínea y las pruebas funcionales hepáticas.

RIASSUNTO

Discute malattie e ferite del fagato in particolarita', compresovi ascessi, cisti, neoplasie, traume e cirrosi. Tre casi di condizioni traumatiche sono riportati. Nella sezione su cirrosi l'A. pone enfasi sul fatto che questa condizione non e' piu considerata problema puramente medicale. Certi utili procedimenti chirurgici sono delineati, e l'importanza degli studi chimici del sangue e prova della funzione del fegato indicati.

*The creation of culture as defined can never constitute the full achieve*ment of the college. It is essential to awaken the impulses of inquiry, of experiment, of investigations, of reflection, the instinctive cravings of the mind. But no liberal college can be content with this. The impulse to thinking must be questioned and rationalized as must every other instinctive response. It is well to think, but what shall we think about? Are there any lines of investigation and reflection more valuable than others, and, if so, how is their value to be tested? Or, again, if the impulse for thinking comes into conflict with other desires and cravings, how is the opposition to be solved?

It has sometimes been suggested that our man of intellectual culture may be found, like Nero, fiddling with words while all the world about him is aflame. And the point of the suggestion is not that fiddling is a bad and worthless pastime, but rather that it is inopportune on such an occasion, that the man who does it is out of touch with his situation, that his fiddling does no fit his facts. In a word, men know with regard to thinking, as with regard to every other content of human experience, that it cannot be valued merely in terms of itself. It must be measured in terms of its relation to other contents and to human experience as a whole. Thinking is good in itself—but what does it cost of other things; what does it bring of other values? Place it amid all the varied contents of our individual and social experience, measure it in terms of what it *implies*, fix it by means of its relations, and then you will know its worth not simply in itself but in that deeper sense which comes when human desires are rationalized and human lives are known in their entir they can be known by those who are engaged in livi *der Meiklejohn.*

Treatment of Recent Fractures of the Neck of the Femur with Acrylic Prosthesis

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PARIS, FRANCE

THE many problems encountered in the treatment of fractures of the neck of the femur and the mediocrity of the results obtained by the most approved methods now commonly employed have led some authors to suggest primary excision of the femoral head combined with an immediate reconstruction operation. Even the nailing of the fracture by the Smith-Peterson method results, according to the most favorable statistics, in pseudarthrosis in at least 20 per cent of cases. Also, chronic arthritis due to aseptic necrosis of the head of the femur, which is encountered not infrequently regardless of whatever method is used, is one of the factors that have stimulated the demand for a primary reconstruction method.

The indication for the use of the acrylic prosthesis of J. and R. Judet (*Journal de Chirurgie* 65:17, 1949) was in the first place chronic arthritis of the hip joint, especially arthritis following fracture of the neck of the femur. Since the first communication of these authors the indications for application of the acrylic femoral head have steadily increased. In fact, I have already used the method, which heretofore had been reserved for pseudarthrosis and secondary arthritis, in a case of recent fracture of the neck of the femur.

During two years, 15 recent fractures of the neck of the femur have been treated by me with the acrylic prosthesis. In this paper I wish to report my first results.

My patients are inmates of an old peoples' home. They are generally women advanced in years, many senile and some slightly deficient mentally. Their average age is above 71. They have been under my care long enough to be evaluated as to the functional results obtained from the reported procedure.

After careful preoperative preparation of the patient I operated on all transcervical nonimpacted fractures, irrespective of the age of the patient and regardless of the presence of renal cardiac conditions.

The operation is performed on an ordinary table — an orthopedic table is not needed. Anesthesia should be as light as possible. In my opinion it is of some advantage to modify the anesthesia by the addition of curare. With this modification a minimum of inhalation anesthesia is necessary. Blood and plasma transfusions are employed when indicated.

My technic is very similar to that of Judet and Judet. A vertical incision is made, starting at the anterior superior iliac spine and extending downward between the sartorius and the tensor fasciae latae. The fascia between these two muscles is divided. The upper end of the cutaneous incision is extended 3 cm. along the iliac crest, which facilitates retraction of the tensor fascia lata posteriorly. This exposes the capsule of the hip joint.

The capsule is opened by a longitudinal incision. The escape of bloody fluid is evidence that the articulation has been opened. The leg is put into marked external rotation. A curved scissors inserted between the acetabulum and the femoral head secures removal of the head without much difficulty. By maintaining external rotation the surface of the stump of the femoral neck is exposed and the stump is smoothed. A minimum of bone tissue should be sacrificed. A channel is then bored through the neck and trochanter of the femur; this maneuver in the elderly patient should be executed with great care. Introduction of the prosthetic

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[illegible] Salpêtrière, Paris [illegible] shaft follows. It is pushed in first by hand, and then with a few strokes of a mallet, until the stump of the neck penetrates into the cavity of the head of the prosthesis. With the aid of a curved scissors serving as a lever between the socket and the prosthetic head and by means of traction on the internally rotated leg the new head is easily reduced. Flexion of the thigh facilitates this maneuver.

The capsule is repaired with nonabsorbable suture material. The fascia is sutured and the skin is closed. I leave a small subcutaneous drain in for a few days. The hip is kept in marked internal rotation by a plaster of Paris spica. Immobilization is maintained not longer than fifteen days. Physical therapy is then begun, in which the knee is included, and the patient is allowed to get out of bed. It should be emphasized that, at least in my own opinion, early ambulation is important.

A number of femoral heads were removed a few days after the fractures were obviously necrotic, and their friability was such that they could not have offered a solid base for the insertion of a Smith-Petersen nail. This convinced me of the proper choice of my therapeutic method.

In case the femoral neck is somewhat short, the prosthetic head designed by Judet does not assure a sufficient distance between the greater trochanter and the acetabulum. The lack of tonus of the gluteal muscles seems to me to be responsible for the occasional tendency of the femoral head to subluxate. It is for that reason that I modified the prosthesis by adding to it a cufflike extension (Fig. 1). This type of artificial femoral head was designed to limit abduction of the hip—which, however, is a minor handicap when one takes into consideration the greater stability that will result from it in those cases in which the neck of the femur is short.

Also, it seemed to me that the prosthetic head furnished by the manufacturers often had too small a diameter to be used to its fullest benefit, especially in tall persons. The caliber of this head is often

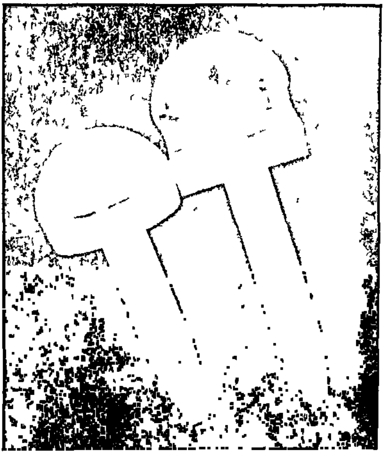


Fig. 1—*Left*, the prosthetic femoral head designed by Judet *Right*, author's model of the prosthesis. The head is enlarged by a cufflike hollow extension.

Fig. 2—Comparative photographs of a prosthesis and a femoral head obtained from a fresh fracture

smaller than that of the normal femoral head covered with cartilage. In Figure 2 one observes a femoral head removed from a fractured hip and the prosthetic head, of larger caliber, placed side by side. The *prosthetic head designed by Judet* was meant to be used in cases of chronic arthritis in which the femoral head is much diminished and the prosthesis is to fill an acetabulum the width and depth of which are reduced by connective tissue. This pathologic condition is not associated with fractures of the femoral neck; therefore, I use a prosthesis of a larger caliber in treating the fracture.

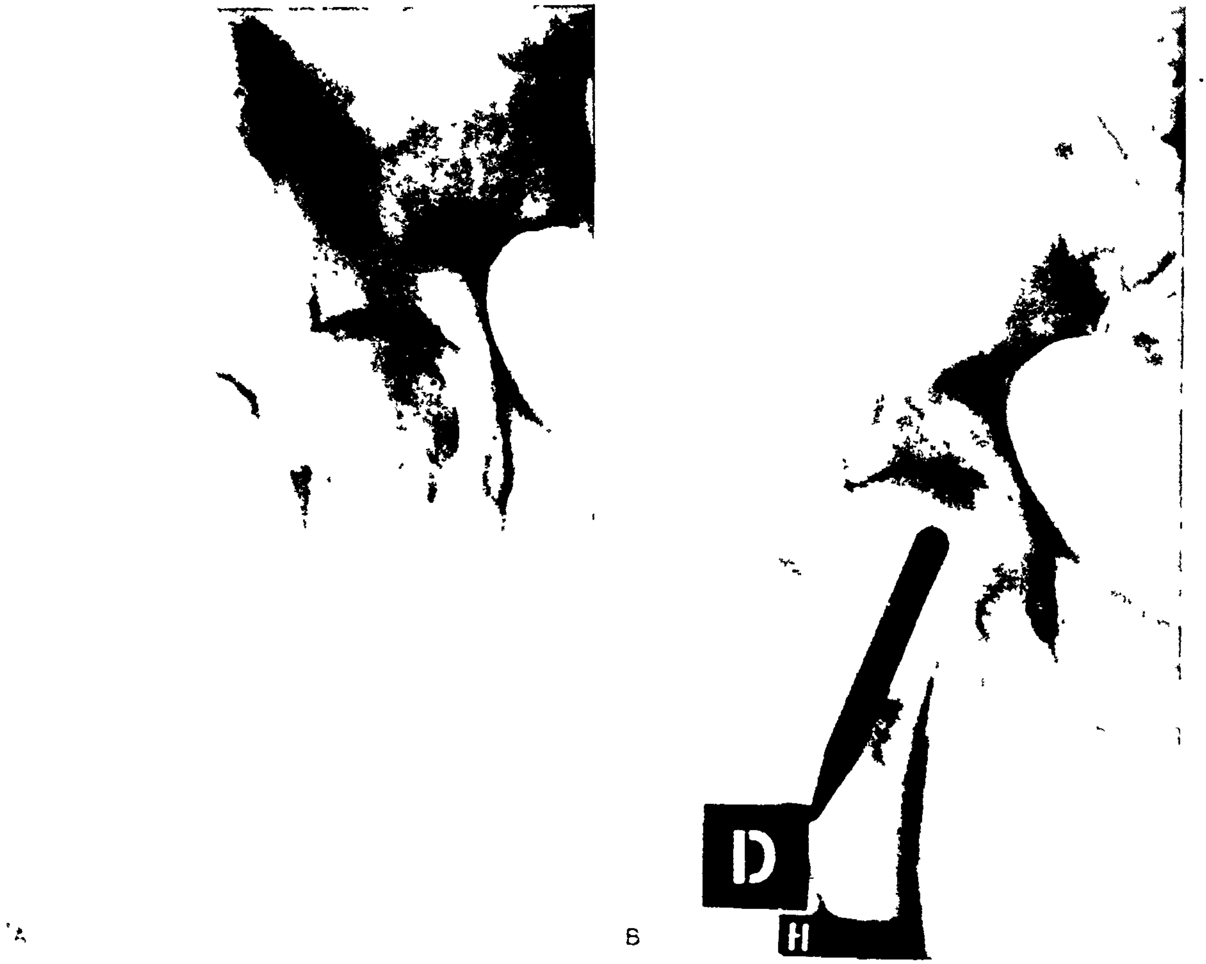
By these two modifications—lengthening the head of the prothesis by means of the aforedescribed cuff above and widening the diameter of the head—I believe that subluxation to the acrylic head can be avoided.

The results in my oldest patients (11 observations) follow:

Cases 1 and 2.—In both of these cases death resulted at the end of two weeks. In the first, that of a woman 79 years of age, death was due to uremia; in the second, that of a woman 72 years old, to cachexia. In the latter case bed sores contributed to the fatal outcome. In both cases the affected hip was immobilized. I have abandoned this practice.

The remaining 9 cases will be reviewed from the functional point of view.

Cases 3 and 4.—One of the patients was a woman aged 67; 1 was a man aged 70, the only male patient in the series. Both were able to walk with the aid of a cane on the



F[illegible]—A, recent transcervical facture. *B*, anteroposterior view of same fracture after removal of femoral head and insertion of prosthesis.

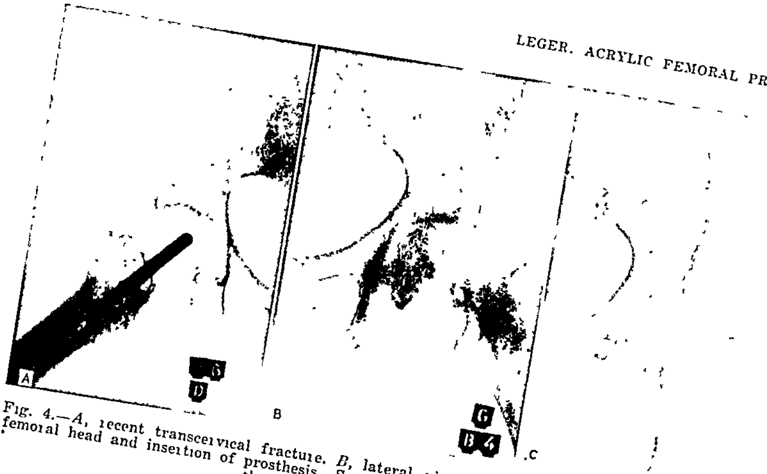


Fig. 4.—*A*, recent transcervical fracture. *B*, lateral view. *C*, same fracture after removal of femoral head and insertion of prosthesis. Since the neck of the prosthesis contains no metal rod, the prosthesis is only faintly visible.

eighteenth postoperative day. Both walked with ease by the end of the first month. The hips were painless and could be flexed to a little less than a right angle. At the time of writing, one year after the operation, the woman is employed at the hospital. She walks in a satisfactory manner. There is secondary stiffness of both knees. For the last six months she has gone to the markets in the neighborhood. Both patients are intelligent and energetic. This has been of much help in their reeducation.

Cases 5 and 6.—The patients in these 2 cases were able to get out of bed and walk on the twenty-fifth postoperative day. In 1 of them, a 78-year-old woman, recovery was retarded by an abscess in the sacral region; in the other, 65 years of age, by pressure sores on the heels. Nevertheless, after two months both walked satisfactorily. In 1 of these 2 cases the hip was slightly stiff; in the other there was good mobility (flexion to 90 degrees, abduction and rotation to approximately 30 degrees).

Case 7.—The patient, a woman 70 years old suffering from diffuse rheumatism, walked satisfactorily at the end of two months, hampered somewhat by stiffness of the knees, which still inconveniences her more than does the hip condition.

Case 8.—The patient, 75 years of age, presented a postoperative hematoma. She was able to walk three weeks after the operation. At the end of three months, despite a small residual fistula, she could go up and down stairs without a limp, aided by one cane.

Case 9.—A patient 76 years old suffered from incontinence, kidney trouble and mild senile dementia. She died nine months later of pneumonia. She had learned to walk with the aid of two canes.

Case 10.—The patient, aged 71, did not want to get out of bed, owing to senility and timidity. Three months after the operation she was able to walk about, though with some difficulty due to arthritis of the lower extremities.

Case 11.—The patient, a woman 62 years of age, was operated on after some delay because of thrombosis and embolism which necessitated ligature of the femoral vein and also of the inferior vena cava. She was operated upon two and a half months after the fracture. She was able to walk on the fortieth postoperative day. At the time of writing, after eighteen months, she walks with the aid of two canes. She has some limitation of motion in the hip and so [illegible] f the leg, the edema being a se [illegible] mbosis is so frequently associated with fractures of the lower extremities.

COMMENT

These were the results in the prosthetic reconstruction of the hip joint performed for 11 recent transcervical fractures of the femur. Whether or not this method ought to be adopted for younger patients will depend largely on how long this prosthesis can be comfortably tolerated. However, since the danger of pseudarthrosis and aseptic necrosis of the femoral head is about the same for the young as for the old patient, I feel justified in recommending this method for younger persons as well. In fact, I have already started to use this procedure for my younger patients.

SUMMARY

A technic for use of the prosthetic femoral head is described as applied in 11 cases of recent transcervical fracture of the hip. A modification of the prosthetic head was designed by the author so as to prevent dislocation of the prosthesis.

No immediate operative death occurred, although the procedure was used for old patients exclusively. The patients were able to get up early and to bear weight on the operatively treated leg. There was a useful range of motion and relatively little discomfort. The author is now using this method for recent hip fractures in younger patients as well.

RESUMEN

Se describe una técnica para uso de la cabeza femoral protésica, aplicada en 11 casos de fractura transcervical reciente de la cadera. El autor propone una modificación de la cabeza protésica para prevenir la dislocación de la prótesis.

No ocurrió ninguna muerte operatoría inmediata, aun cuando el procedimiento se usó exclusivamente en pacientes ancianos. Estos pudieron levantarse tempranamente y sostenerse sobre el miembro operado. Hubo util extensión del movimiento y relativamente poca incomodidad. El autor está usando ahora el método para fracturas recientes de cadera en pacientes más jóvenes también.

RÉSUMÉ

Une technique orthopédique de substitution est ici décrite pour l'utilisation de la tête du fémur, technique appuyée par 11 cas récents de fracture transcervicale de la hanche.

L'auteur décrit une modification de la technique d'utilisation de la tête du fémur pour prévenir son déplacement.

Même chez des patients avancés en âge, il n'y a aucune mortalité. Les patients purent se lever tôt et se porter sur leur jambe opérée. Sans trop de malaises, les patients peuvent se mouvoir dans un arc permettant l'usage courant du membre. L'auteur se sert de sa méthode maintenant chez les jeunes pour les fractures récentes de la hanche.

ZUSAMMENFASSUNG

Es wird eine Technik fuer die Anwendung einer Prothese des Oberschenkelkopfes beschrieben, die in elf kuerzlich behandelten Faellen von Oberschenkelhalsbruechen benuetzt wurde. Der Verfasser gibt eine Modifikation der Kopfprothese an, die eine Verrenkung der Prothese verhueten soll.

Obgleisch das Verfahren ausschliesslich an alten Kranken angewandt wurde, kam kein unmittelbarer Todesfall vor. Die Kranken waren in der Lage, fruehzeitig aufzustehen und das operativ behandelte Bein zu belasten. Der erzielte Bewegungsgrad war zufriedenstellend und die Beschwerden waren verhaeltnismaessig gering. Der Verfasser wendet diese Methode jetzt auch in frischen Faellen von Hueftbruechen bei juengeren Kranken an.

RIASSUNTO

Un tecnico d'avvantaggio della testa femorale protesi e' descritto, che si applica in 11 casi di fratture recenti dell'anca tipo transcervicale. Una modifica-

zione della testa protesi designata dall'A di modo che impedisce la lussazione del protesi

Non occorso morte operativa immediata sebbene il procedimento e' stato usato esclusivamente a pazienti anziani I pazienti erano capaci di levarsi presto, e sopportare peso sulla gamba operata VI era un giro di movimento utile e relativamente poco scomforto L'A oggigiorno impiega questo metodo per fratture recenti dell' anca nei pazienti piu giovane

When man's actions are the subject of study the difficulties are even greater than in studying the behavior of animals What one man does depends upon what others do, and the actions of all are influenced not only by their own nature and experience, but by what their parents and ancestors back through countless generations have done It is impossible to experiment with the past of individuals or of their ancestors, and it is hard to get a group of human beings who are so much alike that we can be sure of the influence of the factors to which some of them are subjected, being the real and sole cause of differences observed In spite of all this, however, much that is scientific has been learned of human behavior, some of it helpful in practical affairs—*Edwin C Kirkpatrick*

So far as leisure means the state of having nothing to do, of having no duties to perform but only inclinations to follow, there is no prospect that leisure will ever become the general lot of mankind The indications point in the opposite direction If the world of our day has little room for idle people, the world of the future will have still less There are no signs that I can see that society is advancing toward a workless state of existence when men will be able to live the life of lotus eaters In the kind of civilization we have created, everybody is needed to put his shoulders to the wheel, and in the higher civilization which is to arise out of this, our posterity shall be more fully employed than we are The higher our civilization becomes, the more it will demand of us all in the way of vigor, industry, skill, and forethought—*L P Jacks*

To be alive, to act, to contemplate, to embody significance and value to become fully human—these ends are difficult of achievement, and they are all the more so at a time like the present when the whole weight of our civilization is thrown in the opposite direction and, as Spengler has profoundly demonstrated, tends towards forms of sterility and death But these goals are none the worse for being difficult, and even if the battle were doomed to be lost, one would remember that the path of salvation lies not in the victory, but as Krishna tells Arjuna, in the acceptance of battle "Not tame and gentle bliss, but disaster, heroically encountered is man's true happy ending", and in this spirit one can face with equanimity both life itself and its tragic and ambiguous rewards—*Lewis Mumford*

"Chemical Lobotomy" for Intractable Pain

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As early as November 1936 Freeman and Watts, on the occasion of performing lobotomy for an indeterminate mental disease, were able to ascertain that the patient could walk alone on the first postoperative day, in spite of disturbances of the leg which had kept her bedridden for a long period. Although walking must have been very painful, the patient never voluntarily complained, and she insisted on continuing her movements. By November 1943, Freeman and Watts were systematically employing lobotomy for painful conditions. Their initial trials of the method were crowned with success. Of 44 patients affected by severe pain, 7 had carcinoma; 5 of the 7 were operated on by this technic. The results with regard to relief of pain were successful.

Later, in January 1948, Scarff, applying another technic, performed his first unilateral prefrontal lobotomy. In 1949 he published the results obtained by this operation performed for intractable pain in 33 cases. These results were good in 66 per cent of the group, fair in 18 per cent and poor in 15 per cent.

By 1950 Scarff's material had increased to 58 prefrontal lobotomies for relief of intractable pain. Thirty-eight patients had ceased to complain of pain and to ask for narcotics. Thirty-five of the 38 had inoperable carcinoma. In 12 other cases partial success was obtained; thus, 86 per cent of the patients were benefited by the operation.

Condrau reported from Krayenbuhl's Clinic in 1950 on 10 patients lobotomized for pain. None of these patients had carcinoma. The results were not remarkable, and most of the patients relapsed. Good results were observed only in those instances in which the operation had brought about an obvious change in the whole personality.

Munkvad reported from Copenhagen on 3 patients with intractable pain, none of whom had carcinoma. After lobotomy considerable psychic changes were observed. It became possible to withdraw the large supply of narcotics that had been required preoperatively.

In 1950 Huber reported 12 lobotomies performed on patients with intractable pain. In the overwhelming majority of cases (90 per cent) the operation gave a satisfactory result. Nine of these patients had carcinoma.

How is this effect of lobotomy to be explained?

All such experiences as those mentioned prove that section of the corticothalamic pathways either relives pain or deprives it of its somatic component. When the mortality rate of lobotomy (3 to 4 per cent) is compared with that of other operations performed for relief of pain, many facts argue in favor of prefrontal lobotomy. As to the other procedures used for intractable pain, such as chordotomy (Schuller; Spiller) or section of the spinothalamic tract (White; Schwartz; Dogliotti; Klemme), they undoubtedly involve a far greater risk, although Klemme's experience and results have been excellent. The same probably holds true with regard to Spiegel's stereoencephalotomy (1947, 1950).

Practical Experience.—Since June 1950 I have been trying to determine whether infiltration of the frontal portion of the brain with procaine hydrochloride or phenol ("chemical lobotomy") could not produce the same effects as does prefrontal lobotomy. First, it was my intention to apply this method for the relief of pain in patients for whom a permanent effect is not required, their expectation of life being too short. The advantages of the procedure as compared with lobotomy are as follows:

[illegible]

TABLE 1 —*Data on 6 Cases of 'Chemical Lobotomy'*

Case	Age and Sex of Patient	Basic Illness	Approach	Side of Injection	No of Injections	Treatment Begun	Issue	End Result
1	46 F	Genital carcinoma with pelvic metastases	Freeman and Watts	Contralateral	5	6/13/50	Patient died 7/20/50	Fair
2	52 M	Inop bronchial carcinoma after probat thoracotomy	Freeman and Watts	Contralateral	2	6/21/50	Patient died 8/3/50	Abuse of morphia probably failure
3	47 M	Inop bronchial carcinoma	Scarff	Homolateral	2	7/5/50	Patient died 9/25/50	Excellent*
4	46 F	Inop bronchial carcinoma	Freeman and Watts	Homolateral	1	6/28/50	Patient died 11/2/50	Failure
5	48 M	Inop bronchial carcinoma after probat thoracotomy	Scarff	Homolateral	1	10/23/50	Patient still under hosp treatment	Excellent**
6	40 M	Relapsing bronchial carcinoma after pneumonectomy	Scarff	Homolateral	1	10/30/50	Patient died 11/10/50	Partial success

*After 1 infiltration the patient was given relief for fifty days, after 2 infiltrations to the end of his life

**At the time of writing this patient after 1 infiltration has been free from pain for forty six days

1 The injection, which is administered through a small bore-hole, seems to me less harmful than lobotomy

2 The bore-hole once made, the injection may be repeated transcutaneously This creates the possibility of protracting the effect

3 Infiltration of the frontal portion of the brain provides a better location for elimination of the pathways than does either closed or open lobotomy

Technic—The lobotomy approach of Freeman and Watts was employed as well as that recommended by Scarff for unilateral prefrontal lobotomy After a small hole had been bored in the aforementioned areas, procaine hydrochloride and, at times, phenol was injected in varying doses The infiltration has been performed on the contralateral as well as on the homolateral side In order to prevent outflow of the injected liquid, one should fit the needle and then change the position of the patient's head in such a manner that the point of piercing is at the apex

Results—Up to the time of writing, 6 patients with severely painful conditions have been treated by this infiltration technic A survey of their cases is presented in Table 1

COMMENT

As to the quantity of procaine required for successful infiltration of the frontal lobe of the brain, it has not yet been quite ascertained In the early cases appropriate trials were made which proved that doses up to 14 cc of 1 per cent procaine hydrochloride could be tolerated in one session

In the first case in the present series, 3 cc. of a 6 per cent aqueous solution of phenol was added to the procaine solution. It was from block of the trunk ganglions that I selected this type of injection. I introduced it in collaboration with Rabinovici in 1947, because it had proved more appropriate than injection of alcohol or procaine.

A survey of these cases shows that the path of approach indicated by Scarff led to better results than did that recommended by Freeman and Watts.

Infiltration of the frontal lobe with chemical substances is not of recent date. It has been tried before, but in the early period of lobotomy, in the treatment of psychoses (Monz and Lima, 1936; Fiamberti, 1937). The former authors injected alcohol, the latter a 10 per cent solution of formaldehyde. Donagio in 1939 advised the injection of anesthetics into the frontal lobe for psychoses. The authors aforementioned, however, abandoned the procedure in favor of lobotomy (see Freeman and Watts, 1942).

As far as I know, there is nowhere in world medical and surgical literature any reference to infiltration of the frontal lobe of the brain in the therapy of intractable pain.

Particular interest attaches to the observation that after operative lobotomy, as well as after infiltration of the frontal lobe of the brain in my small series of cases, it was often possible to withdraw alkaloids without giving rise to withdrawal symptoms. Thus, Scarff was able to show with his first series of 33 patients that unilateral lobotomy allowed 15 who had been addicted to drugs to undergo withdrawal of narcotics without showing any of the usual withdrawal symptoms. Infiltration of the frontal lobe in the patients I have treated gives results similar to those of operative lobotomy.

Cases 1 and 5 (Table 2) offer proof of the fact that sudden withdrawal of narcotics after infiltration of the frontal lobe is not followed by withdrawal symptoms. Scarff has attempted to explain the nonappearance of these symptoms after operative lobotomy, but it is still impossible to determine satisfactorily the cause of this phenomenon.

Infiltration of the frontal lobe may be followed by slight shock. Some of my patients had tachycardia and a slight fall in blood pressure (on an average, from 10 to 15 mm. of mercury). The pupil on the side on which injection was performed was sometimes dilated. Nystagmus occurred in several instances. Neurologic examination revealed no pathologic change whatever. Depersonalization did not occur in any case, though in 1 (Case 4), in which the infiltration resulted in failure, there was a certain disorientation during the first few days after the injection. As to the psychic effect, in 1 case only was there a reaction similar to those observed after operative lobotomy, the patient remarking that she still felt pain but was "not interested any more". In the most successful cases (3 and 5) the patients showed no symptoms of shock after infiltration, were never disorientated and evinced no signs of depersonalization.

TABLE 2. — *Withdrawal of Drugs*

Case	Addiction Before Infiltration	Addiction After Infiltration	Withdrawal Symptoms
1	+ +	0	0
2	+ +	+ +	X
3	0	0	X
4	+ +	+ +	X
5	+ +	0	0
6	+ +	+	?

In 2 cases in my department in which the patients died, extraordinarily exact postmortem observations and histologic slides were made (Dr Paul) In both cases, examination of the channel of puncture revealed in its course small cysts filled with a serous content Histologic examination of the ganglion cells in the area surrounding the channel of puncture revealed no sign of pathologic change

SUMMARY

The author presents data on a series of 6 patients with inoperable or relapsing carcinoma with severe and intractable pain For relief of this pain the author introduced an entirely new technic as used for this purpose, "chemical lobotomy", or infiltration of the frontal lobe of the brain with procaine hydrochloride, with or without the addition of phenol The analgetic results were excellent in 2 cases and, considering the short life expectation of the patients, gave relief from pain for a comparatively long period In 1 case the result of the treatment must be classified as fair In 1 the result was not clear, *owing to the fact that the patient died ten* days after the injection In 2 cases the procedure yielded no effect

Infiltration by the approach used by Scarff for lobotomy apparently brought better results than did infiltration by the approach of Freeman and Watts Homolateral infiltration seemed to be more efficacious than contralateral infiltration The postmortem observations will be discussed in a later publication

RÉSUMÉ

*Pour soulager les douleurs insuppor*tables due cancer inoperable ou recidivant dans 6 cas, l'auteur au lieu de faire la lobotomie, fit une infiltration prefrontale de la partie anterieure du cerveau a l'aidede la novocaine, avec ou sans addition d'alcool Dans 2 cas le resultat analgesique fut excellent, (prenant en consideration que les malades n'avaient pas longtemps a vivre) donna un soulagement considerable Dans 1 cas les resultats ne furent pas aussi satisfaisants Dans un autre cas, on n'a pas pu evaluer les resultats vu que la mort survint 10 jours apres l'operation Dans 2 cas, la procedure n'eut aucun resultat La direction dans l'injection employee par Scarff pour la *lobotomie en presence de douleur lancinante* est apparemment meilleure que celle decrite par Freeman et Watts L'infiltration homolaterale parut preferable a l'infiltration contralaterale

Les resultats de l'autopsie dans ces cas feront l'objet d'une communication subsequente

ZUSAMMENFASSUNG

Zur Linderung hartnaeckiger Schmerzen bei unoperierbarem oder rueckfaelligem Krebs hat der Verfasser in sechs *Faellen anstatt der Lobotomie die prae*frontale Infiltration des Stirnhirns mit Novokain mit oder ohne Alkoholzusatz ausgefuehrt In zwei Faellen war die eintretende Schmerzlosigkeit ausgezeichnet und die Kranken erfuhren *eine* deutliche Linderung fuer einen angesichts ihrer kurzen Lebensfrist betraechtlichen Zietraum In einem Falle kann das Ergebnis als mittelmaessig bezeichnet werden Bei einem anderen Kranken war das Resultat unklar, weil er zehn Tage nach der Operation starb In zwei Faellen war das Verfahren erfolglos Die von Scarff angegebene Richtung der Einspritzung bei Lobotomien war in Faellen von hartnaeckigem Schmerz offenbar besser als die von Freeman und Watts beschriebene Die gleichseitige Infiltration scheint besser zu sein als die kontralaterale

Die Obduktionsergebnisse dieser Faelle werden spaeter berichtet werden

RIASSUNTO

Per sollevare il dolore intrattabile del carcinoma inoperabile ricadente in sei casi, l'A ha eseguito, in luogo di lobotomia l'*infiltrazione di novocaina prefrontale* della parte frontale del cervello di o senza l'aumento alcool L'analgesia risultanda era eccellente in 2 casi, e nella considera-

zione dell'aspettativa vita breve, diede sollievo evidente per un tempo considerablie. In 1 caso il resultato, dev'essere qualificato favorevole. Con 1 paziente il risultato non era sicuro, dato il fatto che sua morte accadde dieci giorni dopo l'operazione. In 2 casi il procedimento non ebbe effetto. La direzione dell'inizione condotta da Schraff per lobotemia era apparentemente meglio, nella presenza di dolore intrattabile, che quella descritta de Freeman e Watts. L'infiltrazione omolaterale sembra meglio del contra laterale.

L'osservazione dell'autopsia verranno rapportati in appresso.

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Announcement

International Board of Occupational Surgery

The Executive Council of the United States Chapter and the Board of Trustees of the International College of Surgeons have unanimously approved the formation of an International Board of Occupational Surgery, the aims of which are (*a*) elevation of standards for the practice of occupational surgery, (*b*) conservation of the health of the worker after occupational injury, (*c*) official recognition of this specialty, (*d*) stimulation of interest in this field by students and members of the profession, and (*e*) cooperation in the establishment of facilities for graduate education in occupational surgery by means of residencies in hospitals affiliated with medical schools, or their equivalents.

Frederick W. Slobe, M.D., F.A.C.S., F.I.C.S., Chairman

E. C. Holmblad, M.D., F.A.C.S., Secretary

For further details, address Dr. Arnold S. Jackson, Secretary, United States Chapter, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10, Illinois.

Lymphocytic Variations After Irradiation of the Adrenal Glands

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IT IS well known that roentgen rays produce in certain organisms hematic alterations, such as a striking variation in the number of lymphocytes. It is believed that the adrenals play an important role in the mechanism of lymphocytic control, as it has been observed that such variations do not occur in adrenalectomized animals.

We do not know of a case in which this gland would have been irradiated, as the literature reports only those in which the entire body or large parts of this were irradiated, all of which may hide the role played by the adrenal glands. Some investigators report that roentgen rays produce a variation in the number of lymphocytes, in whose mechanism the adrenals do not seem to act. After a careful survey of the literature, we were unable to find references to lymphocytic variations produced in man after irradiation of the adrenal glands.

It is for this reason, and with the purpose of learning something about the influences that adrenal irradiation may have in man, that we have irradiated the glandular zone and studied the lymphocytic variations produced. The investigation was performed with the idea that this method would be helpful in identifying certain phenomena and functions of the adrenals, which in turn would be helpful in disclosing certain important surgical and clinical conditions.

PREVIOUS STUDIES

Several authors have shown that in animals roentgen rays modify the lymphoid tissue and so the concentration of this element in blood; the main alterations being lymphocytic degeneration in the spleen[1] and decrease in the number of circulating lymphocytes.[2] However, some investigators have shown an increase, having correlated lymphopenia with strong doses of irradiation and lymphocytosis with weak doses,[3] a relation which has not been obtained by others who consider lymphopenia the only alteration, independently of the intensity of the stimulus, showing that even the lymphocytosis observed after the weaker doses follows primary lymphopenia.[2e]

Dougherty and White (1945), studying the similarity in the image of the lymphoid tissue and circulating lymphocytes after irradiation, with those images produced after the administration of hypophysiocorticotropic and adrenocortocotropic hormones, came to the conclusion that the hypophysical and adrenal secretions may be the normal mechanism for certain actions attributed to roentgen rays.[4a]

The roentgen rays, like the cortical substances, produce intense or definite lymphopenia in certain species of animals,[4] as well as alterations in the lymphoid tissue similar to those produced after irradiation, though not identical.[4a] Such relations made possible the use of roentgen rays in study of the mechanism of the hypophysioadrenal system in certain lymphoid variations, verifying the importance of said system when it was observed that the changes produced in the lymphoid tissue of animals after irradiation took place only when the hypophysioadrenal system was complete.[5] Other investigators emphasize the humoral participation of the af h-

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anism in the genesis of lymphopenia after irradiation. Barnes and Furth (1943) observed lymphopenia in animals in parabiosis after irradiation, 1 of the subjects being adrenalectomized.[6] Therefore, adrenal participation in lymphocytic variations produced by roentgen rays in animals has been demonstrated.

Even so, some investigators have shown that the roentgen lymphopenic action is not produced by the adrenals only, as it can originate after irradiation of regions not related to the adrenal glands.[7] Dougherty and White (1946) have demonstrated indirect effects due to adrenal activity after weak doses and direct effects independent of the adrenal gland after strong doses. However, Leblond and Segal (1942) did not produce lymphocytic changes by administration of strong doses in adrenalectomized animals.

Experimental Method. — Ten observations on adrenal irradiation were made in 5 normal adults. We recorded the number of lymphocytes per cubic millimeter of blood before irradiation at intervals of fifteen minutes and three, twelve and twenty-four hours after irradiation. The characteristics and doses of irradiation were determined by Dr. Manuel F. Madrazo. The cases studied were as follows:

A. Cases 1 and 2: 180 Kv., 5 Ma., 50 cm. distance, with 0.5 mm. Cu, 1 mm. Al, five minutes, 150 R.

B. Cases 3 and 4: 180 Kv., 5 Ma., 25 cm. distance, with 0.5 mm. Cu, 1 mm. Al, five minutes, 75 R.

C. Cases 5, 6, 7 and 8: 130 Kv., 10 Ma., 50 cm. distance, with 3 mm. Al, five minutes, 117 R.

D. Cases 9 and 10: 130 Kv., 10 Ma., 50 cm. distance, with 3 mm. Al, three minutes, 117 R.

RESULTS

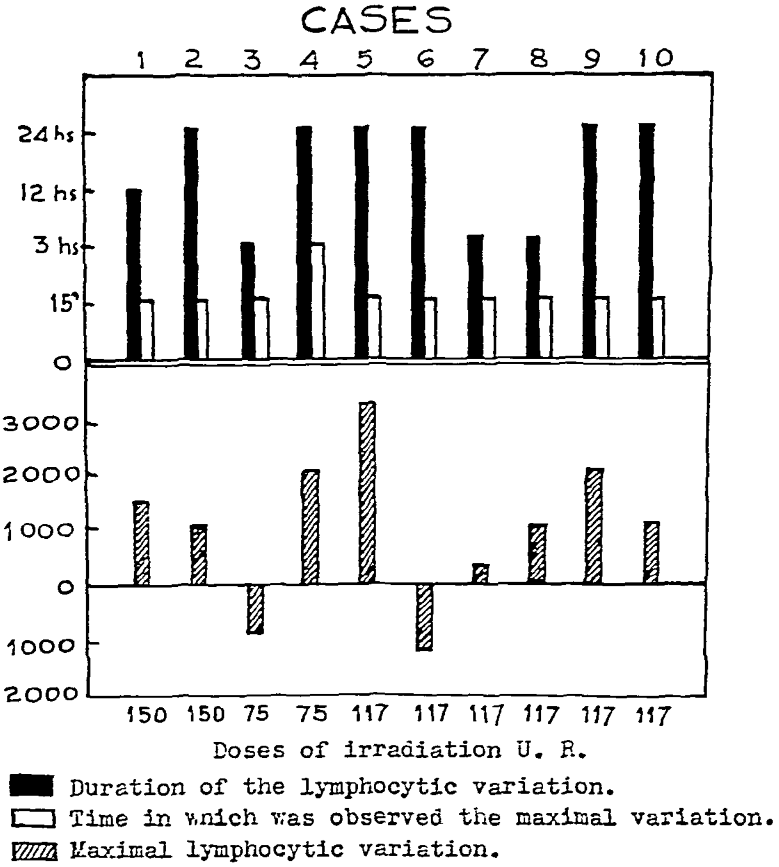
In the total group of 10 cases there was a variation in the number of lymphocytes: an increase was observed in 8 and a decrease in 2. The point of maximal intensity in variation was found to be close to fifteen minutes after irradiation, with the exception of Case 4, in which it was found to be three hours after irradiation. The increase in the number of circulating lymphocytes lasted for twenty-four hours in 5 of the cases, twelve hours in 1 case and three hours in the remaining 2 cases. The decrease in the number of circulating lymphocytes lasted for twelve hours in 1 case and three hours in the other one. As for variations in number, the increase ranged from 600 to 3,212, starting from the number observed before irradiation, and the decrease ranged from 992 to 1,264.

Neither the increase nor the decrease in the number of circulating lymphocytes showed a relation in type or intensity as a response to the variations in stimulus. With the same type of stimulus in 2 of the cases, an increase in the number of lymphocytes in 1 of the adrenals was observed, while there was a decrease in the other (Cases 3 and 4 and Cases 5 and 6).

COMMENT

It seems logical to conclude that the results obtained were produced by adrenal irradiation, since they appeared in almost all of the cases, with a point of maximal intensity at the fifteen-minute count. Considering that by irradiating the glandular zone both the cortical and the medullary portions are stimulated (at least theoretically), it is necessary to determine to which of these parts the response must be attributed. In most cases reported in the literature the effects produced by irradiation have been attributed to the adrenal cortex; however, considering that the adrenal medulla may also be stimulated,[8] we shall consider both factors. Most investigators have obtained a *decrease* in the number of lymphocytes; in our experiments the predominant effect, both in frequency and duration, was an *increase* in the number of lymphocytes.

It has been demonstrated by several experiments that it is possible to produce lymphocytic variations by stimulating cortical or medullary activity. The administration of ACTH produces lymphopenia; this hormone acts as a stimulus to



Lymphocytic variation after irradiation

the adrenal gland[14] Lymphopenia is also *produced after the administration of* adrenocortical extracts[4] In addition, it has been demonstrated that the oxygenated steroids in C 11 are the compounds which exert the lymphopenic influence, desoxycorticosterone not being effective, in contrast with cortisone, compound F of Wintersteiner, E of Kendall and other steroids which produce it[15] Such lymphopenic effects produced after the administration of adren ical hormones have also been observed in man.[9] Furthermore, a certain parallelism has been observed in the number of circulating lymphocytes and variations in ketosteroids.[10] At any rate, all evidence available, clinical and experimental, seems to point out the relations of hyperfunction of the adrenal cortex with lymphopenia and hypofunction of the adrenal cortex with lymphocytosis.[11] Recently (1950) Dury demonstrated that epinephrine as a stimulus for the production of lymphocytes acts independently from the rest of the gland.[12] Inversely, some investigators report that reduction of the chromaffin system produces lymphopenia.[13] Therefore, a relation of lymphocytosis-hyperfunction of the adrenal medulla and lymphopenia-hypofunction of the adrenal medulla is so established.

On the basis of the facts already discussed, it is possible to say that the lymphocytosis observed is due to a predominance of medullary stimulation or cortical inhibition; and we say predominance because it is not possible to disregard either of the two factors involved. We are inclined to believe that stimulation of the adrenal medulla is more liable to produce it, since (1) our experiments agree with those mentioned before, and in which, with other biological tracers, certain modifications attributed to epinephrine were obtained, and (2) there are no references to prove that irradiation would originate the responses attributed to inhibition of the adrenal cortex; instead, cases are reported in which stimulation was proved. Hugh (1949) observed an increase in ketosteroids after irradiation.[14] As for the lymphopenia, it is believed to be the result of a predominance in stimulation of the adrenal cortex.

The fact that neither type of response (increase or decrease in the number of lymphocytes) showed any relation to the type or intensity of the stimulus and that both types of response were obtained in 1 of the cases, in which a stimulus with the same characteristics was used, indicates that the lymphocytic responses produced after roentgen irradiation of the adrenals is based largely on the functional state of each gland.

CONCLUSIONS

1. The adrenal glands, after being stimulated with roentgen rays, are capable of producing variations in the number of lymphocytes.

2. The variations observed consist mainly of an *increase* in the number of lymphocytes, which, by analogy to experiments in animals, may be attributed to medullary stimulation.

3. A *decrease* in the number of lymphocytes is also produced; though it is less striking in man, several investigators have reported it to be the predominating effect in animals. This decrease can be attributed to stimulation of the adrenal cortex.

4. There does not seem to be a relation between the intensity of the stimulus and the type of response, at least with the types of stimulus used in our experiments.

5. In the same subject and with the same type of stimulus, roentgen irradiation of the adrenals may produce different responses.

6. Study of variations in the number of circulating lymphocytes, together with modifications in the hematic cells and blood chemistry produced after irradiation, would be a valuable aid in determining the existence and functional state of the adrenals in certain clinical and surgical conditions, especially before total monolateral adrenalectomy, to disclose insufficiency or congenital absence of the contralateral gland and to provide better postoperative control.

SUMMARY

A study is made of variations in the number of lymphocytes produced after irradiation, in an effort to identify certain phenomena related to the presence and functions of the adrenals. The method used may prove to be a valuable aid in certain conditions of clinical and surgical importance.

RESUMEN

Se estudian las variaciones linfocitarias por irradiacion suprarrenal, en uno de los aspectos de investigacion sobre el particular, con fines a la identificacion de fenomenos relacionados con la presencia y funcion suprarrenal, de posible utilidad en determinadas condiciones de importancia clinica y quirurgica

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Use of Streptokinase-Dornase in Certain Surgical Conditions

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THE work of Tillet, Sherry and Read and their co-workers has established the therapeutic effectiveness of streptokinase (SK) and streptodornase (SD) in various medical conditions. No review article on their work is available, but many of the pertinent references are listed.[1] In addition, Wright and his associates have shown the value of SK-SD mixtures in preventing postoperative abdominal adhesions in rabbits.[2] These enzymes, SK and SD, are now available in sufficient quantity and in a partially purified form so as to be of practical significance.

The mechanism of action of these two agents has been presented in detail in various references among those cited.[1] Suffice it to say here that SK activates a fibrin lysing system occurring naturally in human blood and that SD accelerates the depolymerization of desoxyribose nucleoprotein. Both fibrin and the latter substance are conspicuous ingredients of purulent exudates and other pathologic processes of the human body. The streptokinase reaction requires a specific substrate which is present in human and rabbit blood but absent in certain other animal species.

Various surgical conditions would obviously be benefited by the type of adjunctive therapy offered by SK-SD, and with this in mind the drug was evaluated for the following conditions: decubitus ulcers, burns, wound infections, fascial sloughs, eviscerations, infected sinus tracts and fistulas, hematomas, certain chest conditions and a small miscellaneous group. It should be emphasized that the drug was used only as an additional aid in the total management of each patient. Recognized methods of management and therapy, including antibiotics, must be maintained along with SK-SD therapy.

Methods.—Streptokinase and streptodornase were furnished* in vials containing mixtures of the two drugs in a lyophilized, sterile, partially purified form. In some cases the ratio of SK to SD was 4 to 1 and in others the ratio was 2 to 3. For use, the contents of each vial was reconstituted in sterile, isotonic saline and the solution applied as indicated, according to the condition under treatment. In all cases the drug was diluted approximately twenty to thirty times just before use in order to nullify the SK inhibitor present in the concentrate. The drug was always used immediately after it was placed into solution.

The patients chosen for this form of therapy were those who seemingly would benefit most from this type of enzymatic débridement. These agents were used as adjuncts in the management of each case; they were not a substituted form of therapy. Each patient was followed closely during the course of treatment and was re-treated when necessary. Usually more than one application of the drug is needed, since the agents are labile and their period of action is self-limited.

The method of application of the SK-SD solution necessarily varied according to the condition treated, since the basic principle of the therapy calls for direct action of the enzymes upon their specific

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[illegible]

*These preparations were kindly supplied by the Lederle Laboratories Division, American Cyanamid Company, Pearl River, New York.

substrates. In the treatment of decubitus ulcers, fascial sloughs, burns, infected wounds, sinuses and fistulas the drug was applied in the form of a wet dressing. Sterile cotton gauze was placed on the area to be treated, or packed into hollow areas, and the SK-SD solution then soaked into the gauze. The amount of drug and saline solution needed varied with the size of the area treated. Usually from one to three vials were used per treatment, and each vial was diluted with 10 to 40 ml of saline solution. In these cases the purpose of the gauze was twofold: to serve as a dressing, and to supply a mechanical means of holding the solution at the site of treatment

In the case of hematomas, chest conditions and the miscellaneous cases treated (scrotal abscess, hematocele, intact gauze packing which was not removable) the drug was injected directly into the areas under treatment after preliminary aspiration of any free fluid. The area was then reaspirated approximately twenty-four hours after treatment and more drug injected if needed.

The criterion for SK-SD therapy in cases of the first type (those in which wet dressings were used) was the presence of an area with considerable necrotic and inflammatory débris, the partial or complete removal of which was either not possible or not feasible by mechanical means. The objective of the treatment in this type of case was to expedite complete removal of this débris and thus stimulate the normal healing process. In cases of the second type (those in which direct instillation was employed) the criterion for treatment was the presence of thick, unaspiratable fluid considered amenable to SK-SD. The objective of the treatment here was to render this fluid removable through the intermediary of the enzymes injected.

Results.—Decubitus Ulcers: Fifteen individual decubitus ulcers were treated with SK-SD. The size and location of the areas treated, as well as the dosage, bacteriologic picture and results, are shown in Table 1. In all cases the drug was used as a wet dressing by soaking the solution (usually 20 to 30 ml. of sterile saline to 1 vial of the drug) into sterile cotton gauze sponges for surface treatment or by soaking it into sterile gauze packing for deep application. The amount of drug used varied with the size and depth of the área treated. In most cases the amount of drug used per treatment can be determined by dividing the number of treatments into the total dosage (Table 1). The enzymatic action of the drug was

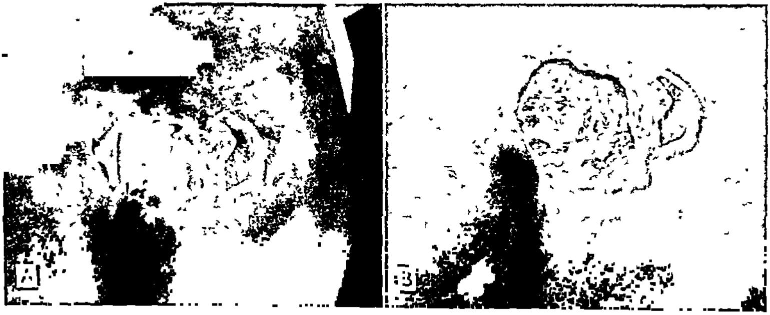


Fig 1.—Decubitus ulcer of sacrum (patient J. R, Case 1, Table 1). *A*, before treatment with streptokinase dornase *B*, forty eight hours later, 1 vial of streptokinase-dornase having been applied for two successive days Note almost complete debridement.

TABLE I.—*Decubitus Ulcers and Burns Treated with Streptokinase-Dornase*

Case	Age and Sex of Patient	Location and Size of Area Treated	Total Dose (U*)	No. of Treatments	Total Days Seen	Bacteriologic Data	Result
1	J. R. 39, M	Sacrum 3×4 cm., to bone	0.6 SK 0.125 SD	3	3	B. proteus, Staph. albus, gamma strep.	Completely débrided and ready for grafting in 3 days
2	J. G. 29, M	Sacrum 15×12 cm., to bone	12.4 SK 3.1 SD	18	35	Beta strep., Staph. albus, Gamma strep., diphtheroids, B. proteus, Pseudomonas, A. aerogenes, paracolon bacilli	Completely débrided and ready for grafting in 35 days
		Left thigh 8×6 cm., to bone	3.4 SK 0.85 SD	5	15	Same as above	Completely débrided and ready for grafting in 15 days
3	E. C. 74, F	Sacrum 5×4 cm., to bone	2.6 SK 0.65 SD	5	5	Not done	Completely débrided and ready for grafting in 5 days
		Sacrum 5×4 cm., to bone	1 SK 0.25 SD	4	4	Not done	Débrided to bone with some granulation tissue at base at time of death of patient
4	R. B. 37, M	Right buttock 2×3 cm., to bone	4.6 SK 1.125 SD	8	26	B. proteus, Gamma strep.	Completely débrided and ready for grafting in 26 days
5	J. I. 60, M	Sacrum 12×10 cm., to bone	2.15 SK 0.537 SD	19	19	Anaerobic strep., gamma strep., B. proteus, Pseudomonas, A. aerogenes	Completely débrided and ready for grafting in 19 days
6	M. S. 46, M	Right hip 3×2 cm., to bone	1.8 SK 0.45 SD	3	9	Pseudomonas, gamma strep.	Completely débrided and ready for grafting in 9 days
7	J. W. 39 M	Right shoulder 3×4 cm., to fascia	1.8 SK 0.45 SD	3	6	B. proteus, gamma strep.	Completely débrided and ready for grafting in 6 days
8	M. H. 39, F	Sacrum 3×4 cm., to bone	0.8 SK 0 2 SD	2	2	Not done	Completely débrided and ready for grafting in 2 days
9	B. H. 24, M	Sacrum 6×5 cm., to bone	0.4 SK 0.1 SD	2	5	B. proteus, gamma strep., A. aerogenes	Completely débrided and ready for grafting in 5 days
10	A. W. 37, F	Sacrum 8×8 cm., to bone	8 6 SK 12.9 SD	7	32	Beta strep., B. proteus, Staph. albus	Completely débrided and ready for grafting in 32 days
		Right hip 4×5 cm., to bone	4.4 SK 6.4 SD	5	18	B. proteus, Staph. albus	Partial débridement with some resistant areas of necrotic tissue remaining
11	E. J 26 M	Sacrum 8×5 cm., to bone	3.0 SK 0 75 SD	5	9	B. proteus	Completely débrided and ready for grafting in 9 days
12	H. B 63 M	Sacrum 2×4 cm., to bone	0 6 SK 0.15 SD	2	4	Pseudomonas, Staph. albus	Completely débrided and ready for grafting in 4 days

TABLE 1.—*Decubitus Ulcers and Burns Treated with Streptokinase-Dornase (Continued)*

Case	Age and Sex of Patient	Location and Size of Area Treated	Total Dose (U*)	No. of Treatments	Total Days Seen	Bacteriologic Data	Result
13	V. M. 51, F	2° & 3° burns of left buttock, 20×18 cm.	6.8 SK 0.3 SD	6	10	Beta strep., Staph. albus, Pseudomonas, Bacillus sp.	Completely débrided and ready for grafting in 10 days
14	R. R. 23, M	1° & 2° burns of neck, anterior chest; approx. 3.5% total body area	2.4 SK 1 SD	2	7	Beta strep., Staph. albus, Bacillus sp., A. aerogenes	Complete healing in 7 days; no graft needed
15	M. B. 30 F	2° & 3° burns of entire right arm, axilla, neck, face, chest; approx. 20% total body area	42.6 SK 25 SD	7	30	A. aerogenes, Pseudomonas, gamma strep.	Completely débrided and ready for grafting in 30 days

*Units of SK-SD are expressed in millions.

frequently augmented with mechanical débridement. Each patient was observed daily and was redressed and retreated whenever necessary, usually each second or third day and sometimes each day. Treatment was continued until all necrotic tissue and exudates had been completely replaced with healthy granulation tissue (1 patient, A. W., right hip, did not respond completely). Occasionally a small pocket of necrotic material remained after the main portion of the ulcer had been completely débrided, thus extending the period of observation and treatment. As would be expected, the smaller ulcers generally required less of the drug and a shorter period of treatment than did the larger ones. All patients received parenteral antibiotics, penicillin or aureomycin, and many were also treated locally with furacin or tyrothricin.

A typical result is shown in Figure 1. This patient (J. R.) had a decubitus ulcer over the sacrum measuring approximately 3 by 4 cm. and extending in depth to bone. After three consecutive days of treatment, with use of 1 vial of SK-SD per day, all of the necrotic tissue had been completely débrided and the patient was ready for skin grafting.

In certain cases there were extended periods of treatment and observation, but this was due, in the main, to small isolated pockets of necrotic material which remained after the major portion of the ulcer had been débrided. In general, the response obtained was in direct proportion to the size and accessibility of the area treated.

Toxic reactions due to SK-SD were minimal, consisting at most of an elevated temperature (100 to 103 F.) for a few hours. This was controlled with aspirin.

Most of the ulcers were studied by bacteriologic cultures, and all yielded a mixed flora consisting of commonly encountered contaminants. There seemed to be no correlation between the bacteriologic picture and the clinical course. Antibiotics were administered to all of these patients. Preliminary experiments have indicated that SK-SD may possess some antibacterial action, thus aiding healing, but this is not as yet established.

The general impression in this group of cases was that streptokinase and streptodornase considerably accelerated the healing process and that they actually cleansed wounds more thoroughly than was possible before their use. The areas treated with SK-SD were ready for skin grafting much sooner than were comparable areas not so treated. The results in this group of cases were very striking, and the use of these agents in decubitus ulcers is definitely advocated.

Burns: A relatively small number of burns were treated in this series (Table 1) but the results obtained definitely warrant more study. Two patients, V. M. and R. R., had relatively small areas involved, and they were treated with wet dressings. Both showed a rapid and complete débridement of necrotic material with a resultant decreased hospital morbidity. The third patient, M. B., had extensive burns covering approximately 20 per cent of the total body area. Here the result was not gratifying, owing to the problem of applying the drug. Wet dressings were uncomfortable and moreover could predispose the patient to chilling and subsequent infection of the upper part of the respiratory tract. In this particular case the agents were placed in solution in sterile saline and a semifluid paste then made with sterile, water-soluble lubricating jelly. This preparation was applied with sterile tongue blades, over which was placed a sterile gauze dressing. The method was satisfactory from the standpoint of both patient and application, but the result was not entirely so. The patients' progress apparently was neither hindered nor particularly helped by the treatment. Possibly the drugs were not released in sufficient concentration from the base preparation, or some factor in the lubricant may have inhibited or antagonized the enzymatic reaction. Theoretically, SK-SD should be of value for burns of all sizes, but until the problem of application is overcome the main use of these drugs will probably be in the management of relatively small burns which can be treated successfully with wet dressings.

These 3 patients were also treated with antibiotics and studied by bacteriologic cultures. Both patient V. M. and patient R. R. showed beta hemolytic streptococci and other common contaminants of the burn site, and yet the necrotic slough was quickly and completely removed.

An extensive study of the problem of treating burns with SK-SD is in progress at this hospital. Until the results of this work are available a complete and definite evaluation of SK-SD for this condition will not be possible.

Wound Infections, Fascial Sloughs, Eviscerations, Sinuses and Fistulas: A number of postoperative and other patients presented one or more of these complications requiring débridement. For the purposes of this report the following definitions have been used: wound infection, a superficial infection with intact fascia: fascial slough, an infection with the superficial fascia involved: evisceration, an infection with the superficial and transversalis fascia and peritoneum involved, with the intestine exposed but not necessarily protruding. In this series a total of 3 wound infections were treated (1 with sinus formation): 4 fascial sloughs: 2 eviscerations in which intestine was exposed, and 2 conditions involving necrotic sinus tracts. All were treated with wet dressings and wet packings of SK-SD, according to the dosage shown in Table 2.

The results in this group of cases were excellent. Healing was remarkably accelerated in all cases because of the rapid and complete cleansing of the wound area. From past experience (before the use of SK-SD) most of these patients would have been expected to have a much longer postoperative illness. In general, the length of time required for complete débridement was directly proportional to the size and accessibility of the area treated. The drugs were especially applicable in the case of sinus tracts and fistulas. One case in point is that of patient I. B. (Case 3, Table 2), who had a postoperative intestinal fistula with exposure of intestine. The postoperative course was stormy and septic. SK and SD were applied once to the infected area: the wound became clean, the septic course was interrupted, and the patient went on to total recovery. Complete credit for the recovery of this patient is not ascribed to SK-SD, but the turning point toward recovery occurred with the use of the drugs.

Figure 2 shows the result obtained in

TABLE 2—*Wound Infections Fascial Sloughs Eviscerations Sinuses and Fistulas Treated with Streptokinase Dornase*

Case	Age and Sex of Patient	Location and Size of Area Treated	Total Dose (U*)	No of Treatments	Total Days Seen	Bacteriologic Data	Result
1	A C F 47 M	Postoperative intestinal obstruction with fascial slough 8×5 cm	0.5 SK 0.2 SD	2	2	E coli Gamma strep Bacillus sp	Completely débrided in 2 days with complete healing in 14 days
2	S T 29 M	Postoperative incisional hernia with wound infection and sinus formation 1 cm skin opening	0.8 SK 0.228 SD	4	5	Paracolon bacilli gamma strep	Not much improvement due to difficulty of applying drug—small skin opening with large undermining infection
3	I B 17 M	Postoperative intestinal fistula with evisceration 10×8 cm	0.6 SK 0.2 SD	1	4	Beta strep Pseudomonas B proteus	Necrotic tissue above granulation base débrided in 2 days fistulous tract not affected
4	E H 75 M	Postoperative colostomy with fascial slough 3×4 cm	1 SK 0.3 SD	3	6	B proteus gamma strep A aerogenes	Completely debrided in 6 days
5	I J 26 M	Postoperative fascial slough 7×5 cm	0.6 SK 0.9 SD	3	6	E coli gamma strep, Pseudomonas	Completely debrided in 6 days
6	I F 25 F	Postoperative gunshot wound with fascial slough 3×4 cm	0.8 SK 0.3 SD	1	3	E coli gamma strep	Completely debrided in 3 days
7	F I 39 F	Multiple abdominal sinus tracts (4) due to radiation necrosis 8×7 cm to 2×3 cm to and through peritoneum	0.6 SK 0.15 SD	1	5	Not done	Sinuses draining freely and much necrotic tissue debrided patient died before therapy completed
8	J D 34 M	Subphrenic abscess with draining sinus tract 2.5×3 cm to subdiaphragmatic abscess	2.0 SK 0.76 SD	16	24	B proteus gamma strep	Completely débrided in 24 days
9	J C 51 M	Postoperative intestinal resection with evisceration 4×3 cm	0.6 SK 0.9 SD	2	5	E coli B proteus	Completely debrided in 4 days
10	J T 25 M	Infected knife wound with much clotted blood 12×3 cm to fascia of thigh	1.6 SK 2.4 SD	4	10	Staph albus, beta strep	Clotted blood evacuated in 3 days wound completely debrided in 7 days
11	G A 48 M	Postoperative exploratory laparotomy with wound infection 3×4 cm	0.8 SK 1.2 SD	2	5	Beta strep B proteus A aerogenes	Wound completely debrided in 4 days

*Units of SK SD are expressed in millions

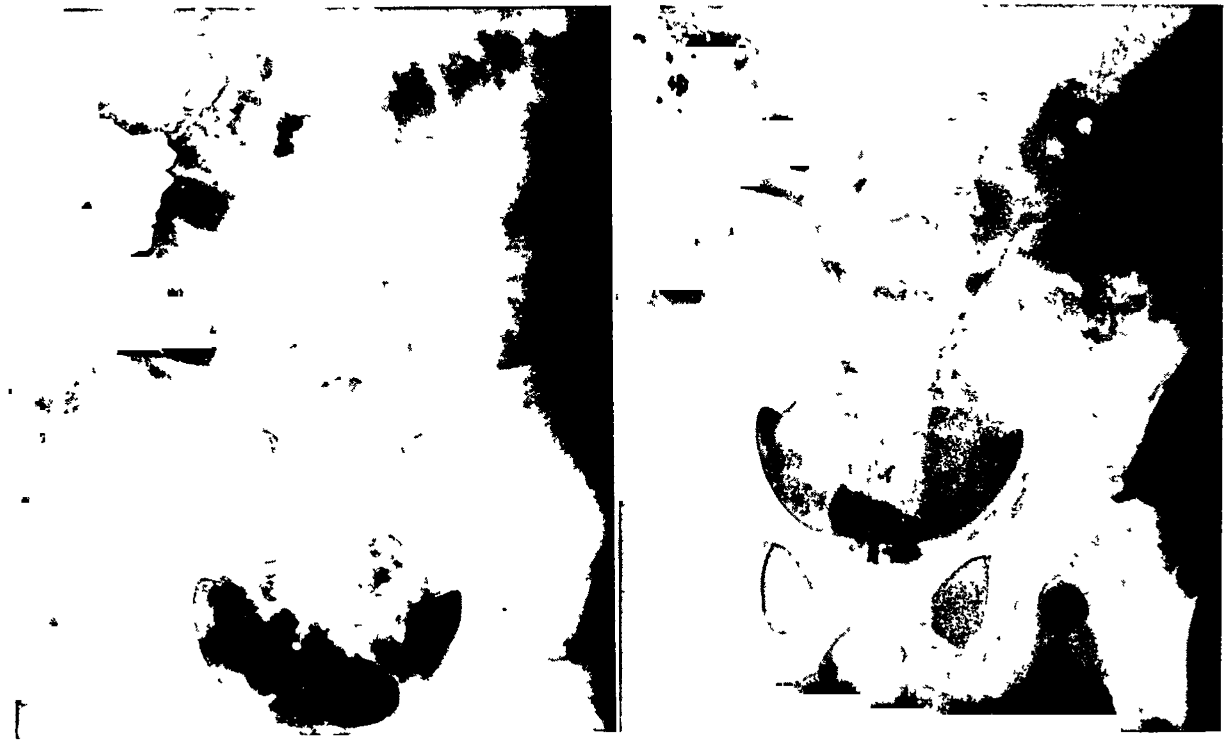


Fig. 2.—Subphrenic abscess with draining sinus tract (J. D., Case 8, Table 2). *A*, before treatment with streptokinase-dornase. *B*, twenty days later, after fourteen treatments with streptokinase-dornase. Note almost complete clearing of area.

the case of a subphrenic abscess with a draining sinus tract. This patient, J. D. (Case 8, Table 2), received a total of sixteen treatments, and after twelve treatments (twenty days) the complete abscessed area was practically clean. In view of the area treated, this was considered a very good result. The patient's postoperative course was smooth and the hospital illness considerably shortened.

The postoperative course of all patients in this group was definitely improved by the use of SK-SD. For example, patient A. C. F. (Case 1, Table 2) had a rather extensive fascial slough with an expected morbidity of approximately four weeks (from past experience). After two applications of the drug on successive days the wound was completely débrided, and it was completely healed in two weeks.

All patients in this group received antibiotics orally or by injection, and some locally, in addition to other means of management.

Although this group of cases is small, the results were sufficiently striking to warrant the use of SK-SD for these conditions. Healing was greatly accelerated, with a significant reduction in hospital morbidity, despite the presence of a mixed bacterial flora in most of the wounds.

Hematomas and Miscellaneous Conditions: In this group 9 individual hematomas were treated with SK-SD; 1 scrotal abscess, 1 hematocele, and 1 instance of packing in a sinus tract which was not removable. In these cases the drug was placed into solution as before and injected directly into the area treated. The theory behind this treatment, in the case of hematomas, was that the clotted blood would possibly be lysed by SK and thus rendered removable by aspiration. Actually the results with hematomas were difficult to evaluate, because nothing could be aspirated from most of them twenty-four hours after treatment, and the period of resolution was variable. However, in 2 patients with bilateral periorbital hema-

TABLE 3.—*Hematomas and Certain Miscellaneous Conditions Treated with Streptokinase-Dornase by Direct Instillation*

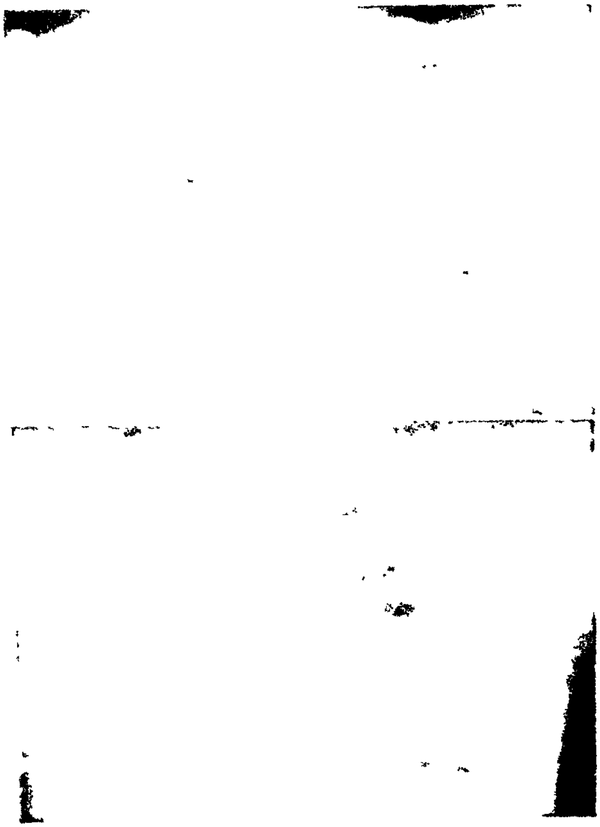
Case	Age and Sex of Patient	Diagnosis	Total Dose (U*)	No. of Treatments	Total Days Seen	Bacteriologic Data	Result
1	J. N. 40, M	Hematoma of face	0.4 SK 0.12 SD	2	6	Not done	Unimproved nothing aspirated before or after treatment
2	M. H. 22, F	Right periorbital hematoma	0.4 SK 0.12 SD	2	6	Negative	Fair swelling considerably reduced in 4 days
3	N. C. 32, F	Hematoma right cheek (5×2 cm.)	0.2 SK 0.08 SD	1	4	Not done	Good, subsided in 48 hours nothing aspirated
4	D. G. 32, M	Hematoma face and right cheek	1.2 SK 0.6 SD	4	9	Not done	Fair resolved completely in 9 days
5	I. P. 40, F	Hematoma right eye and cheek (3×2 cm.)	0.5 SK 0.25 SD	2	4	Not done	Good, aspirated 10 ml. serosanguinous material after treatment completely healed 2 days after last treatment
6	W. J. 36, M	Hematoma right shoulder (3×2 cm.)	0.4 SK 0.125 SD	1	3	Not done	Good resolved in 2 days
7	S. J. 42, M	Bilateral periorbital hematomas	0.6 SK 0.2 SD in left eye rt. eye not treated	2	4	Not done	Good, left eye much less ecchymotic and edematous than right eye after 4 days
8	W. W. 38, M	Bilateral periorbital hematomas	0.4 SK 0.3 SD in rt. eye, left eye not treated	1	3	Not done	Good, swelling considerably reduced in right eye at 24 hours as compared to left eye
		Hematoma of scalp	0.6 SK 0.45 SD	1	3	Hemolytic Staph albus	Good, swelling much reduced in 24 hours and small amount of thin bloody fluid aspirated, bled spontaneously at 48 hours
9	R. T. (Outpatient dept.) 26, M	Scrotal abscess (3×2 cm.)	0.2 SK 0.3 SD	1	5	Not done	Good, aspirated 15 ml. thin fluid 24 hours after treatment, completely reduced in size in 24 hours resolved completely
10	I. A. 30, M	Right hematocele	0.4 SK 0.125 SD	2	2	Hemolytic and nonhemolytic Staph albus	Good, aspirated 106 ml. thin hemorrhagic fluid and scrotum normal in size in 2 days
11	R. W. 20, M	Hemorrhagic tract in left axillary area due to Hodgkin's disease (2×4 cm.) with tight packing intact	0.4 SK 0.125 SD	1	2	Not done	Good, packing easily removed in 24 hours

*Units of SK-SD are expressed in millions

tomas, S. J. and W. W. (Cases 7 and 8, Table 3) one eye was treated and the *other was untreated. In both cases* the size of the treated eye was considerably reduced as compared to that of the untreated eye. Possibly the drug makes possible the resorption of fluids by the body, fluids which cannot be aspirated because they are held in various interstitial spaces.

The amount of drug solution injected into hematomas was necessarily small, varying from 2 to 5 ml. The injection was accompanied by slight pain, which was undoubtedly of mechanical origin. The pain was not severe enough to invalidate the treatment. Cultures were not done of most of the hematomas, on the presumption that they were sterile processes.

More work on the treatment of hematomas is indicated. The results obtained here are suggestive of a beneficial effect, nothing more (Table 3).



The *scrotal abscess and the hematocele* treated by direct instillation of SK-SD responded excellently. Fluid was easily aspirated after treatment, but not before treatment, and in both cases the condition resolved quickly. The other miscellaneous case (patient R. W., Case 11, Table 3), illustrates how the drug may solve certain annoying problems. In this case gauze packing was placed into a hemorrhagic tract and later was found to be so impacted that it could not be easily removed. Two vials of SK-SD were injected into the area, and twenty-four hours later the packing was easily removed. This is merely one of the many little side uses to which the drugs may be applied.

Chest Conditions: Although Tillet and his co-workers have demonstrated the usefulness of SK and SD in the therapy of chests containing loculated, unaspirable fluid,[1] a few such cases are included in this report. The good results of these authors were duplicated by us in 2 cases of traumatic hemothorax (patients T. G. and E. G., Cases 3 and 4, Table 4). Figure 3 shows the result obtained with patient T. G. After 6 treatments covering a period of sixteen days the chest was completely clear. Much thin serosanguineous fluid was aspirated after treatment. The same type of result was obtained with E. G., who had a stab wound of the heart which revealed Streptococcus viridans on culture. Both patients responded well after treatment, and the chests cleared quickly. Of the other 3 patients in this group, J. M. (Case 2, Table 4) was not a good candidate for SK-SD therapy, but his diagnosis was not definite until after treatment had been discontinued. Patient L. H. (Case 5, Table 4) likewise was [illegible] not in need of treatment, since [illegible] had been removed before treatment. However, his chest did remain clear after [illegible] of four vials of SK-SD. Patient L. I. (Case 1, Table 4) was not [illegible] treatment, [illegible] In most

fut donne par instillations Le resultat fut aussi heureux dans les cas d'infection du thorax Les cas d'hematome repondent tres bien au traitement D'autres cas aussi furent tres encourageants

5 Il n'y eut pas de reaction nocive durant l'emploi du medicament

6 *L'usage du medicament doit etre adjointe au traitement standard et ne jamais se substituer a lui*

7 La flore microbienne n'a pas semble nuire a la guerison ni au travail du SK Sd

8 Cette etude souligne le role utile du SK SD pour certains cas de chirurgie Il est cependant encore trop tot pour tirer des conclusions definivites

RESUMEN

1 Estreptoquinasa y estreptododornasa se usaron terapeuticamente en 46 casos quirurgicos, a saber 15 de ulceras de decubito, 3 de quemaduras, 11 de heridas infectadas, aponeurosis necrosadas, eventraciones, senos y fistulas infectadas, 9 de hematomas, 1 de absceso escrotal, 5 de padecimientos toraxicos y 1 de taponamiento con gasa de un seno hemorragico

2 La droga se aplico en forma de curaciones humedas (taponamientos humedos en areas mas profundas) en ulceras de decubito y quemaduras Detersion rapida y completa, quedando listos los pacientes para *injerto cutaneo mucho mas pronto que los no tratados en esta forma*

3 La droga se aplico de la misma manera en heridas infectadas, aponeurosis necrosadas, eventraciones, senos y fistulas infectadas Resultados *tambien excelentes*, curacion rapida y hospitalizacion *considerablemente reducida*

4 Se usaron instilaciones directas de la droga en los demas casos La respuesta en algunos de los casos toraxicos comparable a los *buenos resultados comunicados antes* Resultados generalmente buenos *en hematomas, pero se necesita* mas trabajo para mejor mejor evaluacion Buena respuesta *en los demas estados de* este grupo

5 Las reacciones toxicas de la droga fueron minimas y sin consecuencia

6 La droga se uso solamente como terapeutica auxiliar sin remplazar a los metodos ordinarios de tratamiento

7 *La flora bacteriana no parecio interferir la accion de EQ-ED, ocurriendo a pesar de la misma la detersion y curacion*

8 Este estudio puntualiza la utilidad de EQ ED *en determinados estados* quirurgicos Se requiere mucho mas trabajo para obtener ventaja plena de estos agentes

ZUSAMMENFASSUNG

1 Streptokinase und Streptododornase sind in der Behandlung von vierundsechzig chirurgischen Faellen angewandt worden Darunter befanden sich fuenfzehn Dekubitalgeschwuere, drei Verbrennungen, elf Faelle von Wundinfektionen, Gesichtsnekrosen, Eviszerationen und infizierten Fisteln und Gaengen, neun Bluterguesse, ein Hodensackabszess, eine Blutbeule, fuenf Brusterkrankungen und ein Fall von Gazeverband in einem blutenden Fistelgang

2 In den Faellen von Dekubitalgeschwueren und Brandwunden wurde das Medikament in Form von feuchten Verbaenden (und in tiefer gelegenen Gebieten in Form von feuchten Packungen) angewandt Es fand eine sehr rasche und vollstaendige Reinigung statt, und die Kranken waren viel frueher zur Hautplastik reif als vergleichbare, nicht so behandelte Faelle

3 In gleicher Weise wurde das Medikament bei Wundinfektionen, Gesichtsnekrosen, Eviszerationen und infizierten Gaengen und Fisteln angewandt Auch hier waren die Ergebnisse ausgezeichnet, rasche Heilung erfolgte und der Krankenhausaufenthalt konnte erheblich abgekuerzt werden

4 In den anderen Faellen wurde das Medikament direkt durch Eintroepfelung eingefuehrt In gewissen Faellen von Brusterkrankungen entsprachen die Resultate den frueher berichteten guenstigen Ergebnissen Bei Bluterguessen waren die Erfolge im allegemeinen gut fuer eine

patient. Their sphere of activity and mechanism of action is clearly defined in this and other reports and their use should be limited to their inherent capabilities.

The bacteriologic observations are of interest because they point out that healing is promoted and does occur despite the flora. Possibly SK and SD are bactericidal, as preliminary experiments have indicated, or possibly parenteral antibiotics reach the area in greater concentration because of débridement and better vascular supply. Apparently the bacterial flora do not interfere with healing, and there was no obvious correlation between the types of organism observed and the healing process.

The present study is preliminary and is being extended and expanded. As more experience is gained with these drugs it is expected that new and important uses for them will be found, not only in surgical and medical fields but in others as well. But at least, for the present, both the surgeon and the internist have been supplied with a powerful new therapeutic weapon.

SUMMARY

1. Streptokinase and streptodornase have been used therapeutically in the treatment of 46 surgical cases. These consisted of decubitus ulcers (15 cases); burns (3 cases); wound infections, fascial sloughs, eviscerations, infected sinus tracts and fistulas (11 cases); hematomas (9 cases); scrotal abscess (1 case); hematocele (1 case); chest conditions (5 cases), and gauze packing in hemorrhagic sinus tract (1 case).

2. In the case of decubitus ulcers and burns the drug was applied in the form of wet dressings (wet packings in deeper areas). Débridement was rapid and complete, and patients were ready for skin grafting much sooner than comparable patients not so treated.

3. The drug was applied in the same manner for wound infections, fascial sloughs, eviscerations, infected sinus tracts and fistulas. Again the results were excellent; healing was rapid and hospital morbidity was considerably reduced.

4. Direct instillations of the drug were used in the other cases. The response in certain of the chest cases parallelled the good results previously reported. The results in hematomas were good in general, but more work is needed for better evaluation. The other conditions in this group responded well.

5. Toxic reactions to the drug were minimal and of no consequence.

6. The drug was used as an adjunctive form of therapy only and did not replace standard methods of management.

7. The bacterial flora did not seem to interfere with the action of SK-SD, and débridement and healing occurred despite the flora.

8. This study has pointed out the useful role of SK-SD in certain surgical conditions. Much more work is required in order to obtain full advantage of these agents.

RÉSUMÉ

1. On a employé dans 46 cas de chirurgie le traitement avec la streptokinase et la streptododornase. L'énumération suit: 15 cas d'ulcère de décubitus; 3 cas de brûlures; 11 cas d'infection de la plaie, de sphacèle de la face, d'éviscérations, de fistules et de trajets fistuleux infectés; 9 cas d'hématômes; 1 cas d'abcès scrotal: 1 cas d'hématocèle; 5 cas d'infections thoraciques et un cas de paquetage de sinus àlà suite d'hémorragie.

2. Chez les cas d'ulcères de décubitus et de brûlures, le médicament fut appliqué en pansements humides; (en paquetage humide dans les infractuosités). Le débridement fut vif et complet, permettant une greffe cutanée plus tôt chez les patients ainsi traités.

3. Le médicament fut appliqué de la même façon pour les infections de plaie, sphacèle de la face, éviscérations, fistules et trajets fistuleux. Ici encore le résultat fut excellent, la guérison rapide et le séjour hospitalier d'autant raccourci.

4. Dans d'autres cas, le médicament

The Management of Breast Cancer

Surgical Treatment and Irradiation

JUSTIN J STEIN M D F A C S F I C S, WILLIAM E COSTOLOW M D,
AND ORVILLE N MELAND M D F A C S
LOS ANGELES

THE purpose of this paper is to emphasize the value of the staging of breast cancer and, on the basis of the material at the Los Angeles Tumor Institute, to evaluate the advantages or disadvantages of irradiation therapy in the treatment of this lesion and to determine the most favorable conditions for its use The question as to whether breast cancer can be controlled entirely by irradiation is also considered Although surgeons advocate a thorough radical mastectomy plus irradiation therapy to the axilla, the use of preoperative and postoperative irradiation remains a much debated question

An increasing number of patients with breast cancer is encountered, because life expectancy is constantly on the increase In 1900 the average length of life for women was 49 years, and at present it is 69 In other words, many more women are entering and advancing further into the "cancer age"

Diagnosis —A definite diagnosis should be made in every case of cancer of the breast before definitive treatment is instituted

Regardless of the amount of clinical experience and skill a surgeon possesses, the clinical diagnosis of lesions of the breast must be corroborated by the pathologist There are too many benign lesions which may simulate carcinoma

In our opinion, needle aspiration biopsy under the following conditions is of definite value If a pathologist experienced in this type of procedure is called upon to do the biopsy, if the results of this type of biopsy are conclusive, and if the aspiration biopsy specimen is "positive for cancer," operation is performed in a day or two Frequently a breast lesion will prove to be a cyst under pressure or one located deep in the breast, which may simulate a cancer If fluid is obtained, it is studied histologically, and if the lesion completely disappears after aspiration and no tumor cells are found, the patient is advised to return in two weeks for reexamination If no residual thickening is palpable at that time, no surgical treatment is recommended, and the patient is reexamined at regular intervals If a residual thickening remains, operation is recommended Should the aspiration reveal carcinoma cells, considerable time is saved in the operating room, since a surgical biopsy is not indicated There is no resultant disturbance of the tumor bed, and the necessity for redraping, preparation of the operative area with an antiseptic solution, and the changing of gowns and gloves is eliminated

When aspiration needle biopsy is not carried out for diagnosis, the patient, after careful examination, including roentgenograms of the chest, and skeletal roentgenograms when indicated, is sent to the hospital In the operating room the lesion, when small, is widely excised, including the surrounding noninvolved breast tissue, and frozen sections are made Appropriate treatment is then carried out on the basis of the pathologic observations When the lesion is large or near the surface, a single stroke of the knife through the skin and subcutaneous tissue and into the lesion is sometimes adequate, and a small portion of the tumor can be removed for histologic study without disturbing the tumor bed If the specimen is adequate for diagnosis, the

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St United
Cl urgeons

bessere Auswertung sind aber umfangreichere Erfahrungen notwendig. Die anderen Erkrankungen dieser Gruppe reagierten gut.

5. Die toxischen Reaktionen des Mittels waren aeusserst geringfuegig und ohne Folgen.

6. Die Anwendung des Medikaments stellk auschliesslich eine zusaetzliche Behandlungdar und verdraengte nicht die allgemein angewandten therapeutischen Massnahmen.

7. Die Keimflora schien die Wirkung der Streptokinase und Streptododornase nicht zu behindern; Reinigung und Heilung erfolgten trotz der Flora.

8. Die vorliegende Arbeit hebt die hilfreiche Rolle der Sterptokinase und Streptododornase in gewissen chirurgischen Erkrankungen hervor. Um die Wirkung dieser Mittel voll auszunuetzen, sind noch viel umfangreichere Studien erforderlich.

RIASSUNTO

1. Streptokinase e streptododornase sono stati usati terapeuticamente nel trattamento di 46 casi chirurgici. Sono composti di ulceri decubiti (15 casi); scottature (3 casi); ferite e fistole (11 casi); ematome (9 casi); ascessi scrotali (1 caso); ematocele (1 caso); condizioni del petto (5 casi); l'impacco del cavo emorragico (1 caso).

2. Nel caso di ulceri decubiti ed ustioni la droga viene applicato in forma di medicazione umida (impacchi umida nelle aree profonde). Spontemento rapido e completo, ed i pazienti furono pronti per impianti cutaneo piuttosto che 1 pazienti comparabile non tratti simile.

3. Ferite infette, escare fasciali, sventramenti, cavi infetti e fistole furono tratti nella stessa maniera. Di nuovo i risultati erano eccellenti; la guarigione rapida e morbidita ridotta considerabilmente.

4. Instillaxione diretta della droga viene somministrata in altri casi. La risposta in certi casi dell petto paragona i buoni risultati riportati precedemente. I risultati nelle ematome erano generalmente buoni, ma bisogna piu lavoro per migliore valutatazione. L'altre condizioni in questo gruppo rispondevano bene.

5. Reazioni tossiche alla droga furono minime e senza importanza.

6. Viene usata come una forma di terapia aggiunta e non ricolloca i metodi stendardi del maneggio.

7. La flora bacteriale non sembra introrisultati erano eccellenti; la guarigione mettersi coll' azione di SK-SD, e lo sbrigliamento e guarigione occorrevano malgrado la flora.

8. Questo studio propone il mezzo utile di SK-SD in certe condizioni chirurgiche. Molto lavoro necessita' per ottenere pieno vantaggio di questi agenti.

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volvement of skin, with or without metastases to axillary lymph nodes

Stage IV Tumor in breast with fixation to chest wall (Questionable operability)

Stage V Tumor as in any other group, but with distant metastases

The evaluation of lymph nodes was based on histologic observations Stages II and III could probably be combined It would be difficult to devise a method which would cover all conditions, but it is believed that the above method has many practical advantages

Portmann's method[1] of staging is divided into four groups or stages, as follows

Group or Stage I
  Skin—Not involved
  Tumor—Localized in breast and movable
  Metastases—None in axillary lymph nodes or elsewhere

Group or Stage II
  Skin—Not involved
  Tumor—Localized in breast and movable
  Metastases—Few in axillary lymph nodes involved, no metastases elsewhere

Group or Stage III
  Skin—Edematous, brawny red with induration or inflammation not obviously due to infection, extensive ulceration, multiple secondary tumors
  Tumor—Diffusely infiltrating breast, fixation of tumor of breast to chest wall, edema of breast, secondary tumors
  Metastases—Many axillary lymph nodes involved or fixed, no clinical or roentgenologic evidence of distant metastases

Group or Stage IV
  Skin—As in any other group
  Tumor—As in any other group
  Metastases—Axillary and supraclavicular lymph nodes extensively involved, clinical or roentgenologic evidence of distant metastases

He also lists certain criteria of incurability observed in patients with various clinical and pathologic manifestations of extensive involvement, in whom cure was not obtained by any method employed

Simmons and Taylor expressed the opinion that cancer of the breast is operable if the disease is confined to the breast or to the breast and axilla The primary tumor must also be movable in relation to the chest wall and must not present extensive cutaneous involvement, metastasis to the skin or the subepidermal infiltration known as "inflammatory" carcinoma The axillary lymph nodes must be movable in relation to the chest wall and the great vessels, and these nodes must be few There must be no evidence of disease in the supraclavicular areas or in the opposite axilla, and no metastatic disease in the lungs, pleura, liver or bones

Haagensen[3] has made the following rule for judging operability for carcinoma of the breast "Women of all age groups who are in good enough general condition to run the risk of major surgery should be treated by radical mastectomy, except as follows (*1*) when the carcinoma is one which developed during pregnancy or lactation, (*2*) when extensive edema of the skin over the breast is present, (*3*) when satellite nodules are present in the skin over the breast, (*4*) when intercostal or parasternal tumor nodules are present, (*5*) when there is edema of the arm, (*6*) when proved supraclavicular metastases are present, (*7*) when the carcinoma is of the inflammatory type, (*8*) when distant metastases are demonstrated, (*9*) when any two, or more of the following signs of locally advanced carcinoma are present (*a*) ulceration of the skin, (*b*) edema of the skin of limited extent (less than one third of the skin over the breast involved), (*c*) solid fixation of the tumor to the chest wall, (*d*) axillary lymph node measuring 2 5 cm or more in transverse diameter, and proved to contain metastases by biopsy, and (*e*) fixation of axillary lymph nodes to the wound can then be tightly sutured over gauze, the drapes changed, the operative area prepared again, gloves and gowns changed and a radical mastectomy performed.

It is preferable that definitive operation be carried out immediately if minor surgical procedures on the breast have resulted in a diagnosis of cancer. There is considerable evidence in the literature to show that if there is undue delay (two or more weeks) after diagnostic procedures the results are more often unfavorable.

TREATMENT

The two methods of curative therapy for cancer of the breast are surgical intervention and irradiation, either alone or in various combinations. At present radical mastectomy is the single most effective means of controlling operable breast cancer.

In evaluating irradiation therapy, the following factors must be given consideration:

1. How carefully was the patient examined preoperatively? Were special studies made when indicated, such as roentgenologic examination of the bones when pain was present?
2. Were the axillary nodes examined and studied histologically?
3. Was the extent of the disease carefully staged clinically? If so, by what method?
4. How skillfully was the irradiation prescribed and administered?
5. What was the time interval between the beginning of irradiation therapy and the surgical procedure?
6. How many different surgeons performed the operation?

These points are among the most important to be considered in evaluating the effectiveness of irradiation. *The staging of the disease and the thoroughness of histologic examination of the axillary nodes are without a doubt, however, the most important.*

The significant points to be observed in the surgical management of breast cancer are as follows:

1. Careful staging of the disease.
2. Thoroughness of radical operation, in which the breast, pectoral muscles, and axillary contents are dissected en masse.
3. Thoroughness of histologic examination of the axillary lymph nodes.
4. Selection of a type of incision that conforms to the size and location of the tumor in the breast. No routine type of incision is used for all cases. For the majority of breast carcinomas the Greenough modification of the Rodman incision is preferable. The incision should not extend down the arm, nor should it extend into the axilla. The skin overlying the tumor should be widely removed without regard to the problem of skin closure. Too much time should not be spent on the skin flaps at the expense of thorough surgical attention to the remainder of the operation.
5. Thorough irrigation of the wound with warm saline solution before closure.

The Staging of Breast Cancer.—It is deplorable that a uniform method of staging breast cancer has not been adopted. It is impossible to evaluate reports in the literature unless a method of staging is clearly outlined.

Two of the most prominently mentioned methods are the Steinthal and Portmann classifications.[1] The Steinthal method stresses clinical examination of the lymph nodes, but it will be pointed out in detail in this paper that the method has proved unreliable. The Portmann classification, however, combines both clinical and pathologic observations, and this method has many good points.

The method of staging used in this series is as follows:

Stage I: Tumor in breast, localized and movable; skin and lymph nodes not involved. No distant metastases.

Stage II: Tumor in breast with involvement of axillary lymph nodes. Skin not involved; no distant metastases.

Stage III: Tumor in breast with involvement of skin, with or without metastases to axillary lymph nodes

Stage IV Tumor in breast with fixation to chest wall (Questionable operability)

Stage V Tumor as in any other group, but with distant metastases

The evaluation of lymph nodes was based on histologic observations Stages II and III could probably be combined It would be difficult to devise a method which would cover all conditions, but it is believed that the above method has many practical advantages

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  Tumor—Localized in breast and movable
  Metastases—*Few* in axillary lymph nodes involved, *no metastases* elsewhere

Group or Stage III
  Skin—Edematous, brawny red with induration or inflammation not obviously due to infection, extensive ulceration, multiple secondary tumors
  Tumor—Diffusely infiltrating breast, fixation of tumor of breast to chest wall, edema of breast, secondary tumors
  Metastases—Many axillary lymph nodes involved or fixed, no clinical or roentgenologic evidence of distant metastases

Group or Stage IV
  Skin—As in any other group
  Tumor—As in any other group
  Metastases—Axillary and supraclavicular lymph nodes extensively involved, clinical or roentgenologic evidence of distant metastases

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From a study of these methods of staging breast cancer it can readily be seen that in years past there was considerable negligence in the proper selection of cases for appropriate treatment. In fact, some patients are still being operated upon without even the benefit of a chest roentgenogram, a most important factor in determining prognosis and operability.

Of all factors influencing prognosis, the stage of the disease is the most important. Other factors of importance are (*1*) location of the tumor, (*2*) the presence or absence of pregnancy or lactation and (*3*) the histopathologic picture. It is questionable whether the prognosis is more unfavorable for the young patient with mammary cancer than for the older patient. Primary operable cancers are those in which the tumor is confined to the breast and the corresponding axilla. When metastasis has occurred in the bones, the lungs and the supraclavicular regions the lesion is not operable. Curability and operability are not synonymous terms. Many patients who ask whether operations on the breast "spread cancer" are probably aware of instances in which the surgeons operated in hopeless cases. Such procedures are to be condemned. The size of the tumor is not necessarily indicative of the extent of involvement, because a small tumor may metastasize early and a large tumor late, or vice versa.

Axillary Lymph Nodes.—Surgeons are becoming increasingly aware of the fact that nonpalpable axillary lymph nodes may contain metastases and that large, clinically palpable lymph nodes may be only hyperplastic, without histologic evidence of metastastic cancer cells.

For example, in 30 per cent of the cases reported by Stenstrom and Baggenstoss,[4] the axillary lymph nodes were not palpable but were found to be involved on histologic examination. Haagensen and Stout[5] reported that in 325 cases in which the axillary lymph nodes were not palpable clinically, 143, or 44 per cent, microscopically had axillary metastases. In 278 cases in which axillary lymph nodes were thought to be involved on clinical examination, 236, or 84 per cent, had microscopic evidence of metastases, an error of 15.1 per cent. Simmons, Taylor and Welch noted that in 61 cases in which axillary nodes were found on physical examination, positive evidence of cancer was demonstrated in 53, or 87 per cent, on microscopic examination, and in 79 cases in which no axillary nodes were felt cancer was found on dissection of the axilla in 37, or 46 per cent.

Hooper and McGraw[6] found that in 145 cases with palpable axillary lymph nodes, 111, or 76.5 per cent, had demonstrable metastases, or an error of 23.6 per cent in the clinical evaluation. In 97 cases with no nodes palpable on clinical examination, metastases were later demonstrated in 38 cases, or 39 per cent. At the Los Angeles Tumor Institute the percentage of error in the clinical evaluation of the axillary lymph nodes in 205 consecutive operable cases has been 42 cases, or 20 per cent. It is believed that, in general, thorough careful axillary examinations are not being made and that the percentage of error may decrease as the examinations become more thorough. Mills[7] noted carcinomatous metastases too small to be detected clinically in approximately 50 per cent of the regional lymph nodes. At any rate, unless patients with breast cancer are operated upon, no one can state with certainty whether or not the axillary nodes are involved.

Saphir and Amromin[8] have called attention to the necessity for thorough histologic examination of the removed axillary lymph nodes. They reviewed 30 cases of carcinoma of the breast in which the axillary lymph nodes had been examined and found free of tumor cells. A careful study of these lymph nodes, using serial sections, revealed metastatic carcinoma in 10 of the 30 cases. This error of 33.3 per cent is highly significant in the evaluation of the end results in a series of cases. Of course, the spread of the primary tumor may be to the internal mammary lymph nodes or, secondarily, to the supraclavicular lymph nodes, but because of the location of the primary tumor, in the great majority of instances there is early metastatic involvement of the ipsilateral axillary lymph nodes.

Irradiation Therapy.—It is very important to remember that, whereas surgical treatment of mammary cancer has been standardized for some time, the technics of irradiation therapy have been constantly improving. When series of cases treated surgically and by irradiation prior to 1935 are reviewed, this factor must be kept in mind.

Changes effected by irradiation in the cancer cells in the breast help to deprive the cells of their blood supply and to obliterate the pathways of spread, and tend to "choke off" the cells in scar tissue.

Holley and Melnick,[9] in studying the effect of preoperative irradiation for breast cancer, found that four weeks after the end of the therapy the cancer begins to proliferate again from surviving cancer cells, which remain in at least 90 per cent of breasts so treated. Certainly, therefore, if operation is to be done, it should follow as soon as possible after the completion of irradiation and the subsidence of the irradiation reaction.

The most controversial aspect of the place of radiation therapy in the treatment of breast cancer is the question whether or not it should be given preoperatively or postoperatively. There have been too few adequate series of Stage II or Stage III cancers (skin and/or lymph nodes involved) irradiated preoperatively, because of the unwillingness of surgeons to permit the period of delay necessary to carry out this form of therapy.

It is only after series of cases have been treated under the same scientific conditions in various parts of the United States that we can make a proper analysis of results.

Lenz[10] has pointed out that the administration of an average tumor dose of 4,500 roentgens may cause marked changes in the cancer, yet microscopically viable cancer cells may be demonstrated in the breast removed at mastectomy as long as one year after irradiation.

It is exceedingly difficult, however, for a pathologist in histologically examining irradiated tissue to determine whether the cancer cells are dead, dying or viable. We have repeatedly known irradiated breast cancers to remain quiescent for many months and even years after therapy before the onset of renewed activity.

One point, which is not adequately stressed, is the inherent defensive reaction or resistance of the host to the cancer. For example, we have had patients with recurrence in the operative scar area twenty-one and thirty-two years respectively after radical mastectomy had been performed. In other words, cancer cells were left behind at the time of the operation and remained dormant for years before becoming active. One frequently fails to take into account the inherent resistance of the host to cancer.

Technic of Preoperative Irradiation: The areas to be treated are marked on the skin so that overlapping will not occur. The breast tumor is treated through each of two tangential portals; the infraclavicular and supraclavicular areas are treated through one portal, with the clavicle as its center and the roentgen rays are directed through a fourth portal directly into the axilla. Each of the four portals receives 100 roentgens daily. The factors of treatment are as follows:

KV 185 to 250; TSD 50 cm; half-value layer 0.9 mm. copper to 2 mm. copper; size of portal varies from 10 by 10 to 10 by 15 cm. All areas are treated six times each week. Operation is performed four to six weeks after completion of the roentgen therapy. The cutaneous reaction is usually intense but subsides with practically no changes in the skin, and operation is not interferred with except by the delay in time. The total dosage delivered through each portal is 2,000 roentgens measured in air.

Technics for Postoperative Irradiation: Postoperative roentgen therapy is usually begun from ten days to three weeks after the operation. This therapy is given if no preoperative irradiation has been administered. If adequate preoperative irradiation has been given, then no further therapy of this kind is indicated. The roentgen rays are directed into the axilla through one portal and into the supraclavicular area through another portal. One hundred and fifty roentgens are given daily to each portal. Upon completion of this therapy (2,000 roentgens measured in air), the skin of the anterior chest wall in the operative area is divided into two portals and treated, using the following factors: 100 KV; TSD 30 cm; 0.25 mm. copper and 1 mm. aluminum filter. One of two areas is treated daily with 350 roentgens until 1,050 roentgens have been given to each area. The factors for the therapy directed at the axilla and supraclavicular areas are the same as those used for preoperative irradition.

During the period from January 1936 to June 1945 there were 1,007 patients with breast cancer admitted to the Los Angeles Tumor Institute. Of these, 1,000 had adenocarcinoma of the breast (including 16 with Paget's disease); 2 had sarcoma, and 5 tumors were carcinoma of the male breast. An analysis of this group reveals the following:

1. Number of patients with breast cancer operated on at the Los Angeles Tumor Institute.....	215
2. Number operated on elsewhere and referred for either preoperative or postoperative irradiation	178
3. Number of patients with recurrence and metastases when admitted for treatment.........	210
4. Number treated by irradiation alone	137
5. Number referred for consultation only or for other reasons	267
Total	1,007

During this same period 1,336 patients with benign and inflammatory lesions of the breast were examined.

Analyses of results obtained in patients treated for carcinoma of the breast at the Los Angeles Tumor Institute from January 1936 to June 1945 are given in Tables 1, 2 and 3.

If no involvement of the ipsilateral axillary nodes is found after *thorough histologic study,* we are of the opinion that postoperative radiation is not indicated (Table 1).

It will be noted in Tables 2 and 3 that immediate radical operation plus postoperative irradiation gave the best results when the skin and/or the axillary nodes were involved. Theoretically, preoperative irradiation should be preferable in the cases of this kind, but in this small series there was a definite advantage following immediate radical operation and postoperative irradiation.

Robnett, Jones and Hazard,[11] in studying their patients with metastases to the axillary lymph nodes, concluded that postoperative irradiation therapy was of decided benefit. The five-year minimum survival rate of their patients treated surgically with supplemental postoperative irradiation was 32.2 per cent greater than that for patients treated with surgical therapy alone; the seven-year minimum survival rate was 8.5 per cent greater; and the ten-year minimum survival rate was 18.8 per cent greater.

We know that although cancer of the breast in operable patients can be controlled by roentgen therapy, it is not nearly as effective as surgical therapy and that operation is definitely preferable (Table 4). Irradiation should be combined with surgical treatment when indicated.

As has been mentioned, many of the cancers in this series were controlled by irradiation alone, but three, four, five or more years later the cancer commenced to grow again. Irradiation given as a palliative measure, however, offers considerable benefit to many patients with advanced breast cancer.

In 205 consecutive cases of mammary cancer treated by operation, either alone or in combination with preoperative or postoperative roentgen therapy, there was cutaneous recurrence in the operative scars in 29 patients, or 14.1 per cent. The

TABLE 1.—*Results in Cases of Stage I Cancer of the Breast*

		Survival 5 years or longer		
	Total number of patients	Without cancer	With cancer	With and without cancer
Operation only	16	13 (81%)	1	14 (87%)
Preoperative irradiation	33	24 (73%)	4	28 (84.8%)
Postoperative irradiation	26	18 (69%)	3	20 (76.9%)
Total	75	55 (73%)	8	62 (82.6%)

TABLE 2.—*Results in Cases of Stage II Cancer of the Breast*

		Survival 5 years or longer	
	Total number of patients	Without cancer	With and without cancer
Preoperative irradiation	32	10 (31%)	20 (62%)
Postoperative irradiation	27	16 (59%)	20 (74%)
Total	59	26 (44%)	40 (67.8%)

TABLE 3.—*Results in Cases of Stage III Cancer of the Breast (With Skin Involvement With and Without Involvement of Axillary Nodes)*

		Survival 5 years	
	Total number of patients	Without cancer	With and without cancer
Preoperative irradiation	29	12 (41.3%)	19* (65.5%)
Postoperative irradiation	11	6 (54.5%)	8** (72.7%)
Total	40	18 (45%)	27 (67.5%)

* One postoperative death

** One patient died from heart disease 3½ years after treatment

lymph nodes were incorrectly diagnosed clinically in 42, or 20 per cent. As has been stated, unless patients are operated upon it is impossible to stage the extent of the disease correctly, because clinically the lymph nodes cannot be satisfactorily evaluated. The relatively low incidence of cutaneous recurrence in the operative scar is probably the result of taking a great deal of skin overlying the cancer and using the endotherm knife. Skin grafting was necessary for only 1 patient.

Eleven patients with supraclavicular lymph node involvement were operated upon, none of these patients survived five years. At present we do not operate upon any patient in whom there are definite metastases to the supraclavicular lymph nodes.

The ten year results (Table 5) are encouraging. All the patients in this group, who had metastases to the ipsilateral axillary lymph nodes, were given postoperative roentgen therapy.

The ten-year results in the treatment of cancer of the breast, including patients both with and without axillary lymph node involvement, as reported by other investigators, are as follows: Harrington, 28.7 per cent, Bunts, 13.4 per cent, White, 33.5 per cent, Guthrie and Clough,[13] 25.3 per cent.

How Can Better Results Be Obtained?—The incidence of early breast cancer would probably be greatly increased by instituting an educational campaign, beginning with girls in college or of college age, teaching them how to ex-

TABLE 4.—*Breast Cancer Treated by Irradiation Alone at the Los Angeles Tumor Institute (Meland[12]). 176 Cases with 98.8% Follow-Up*

Steinthal classification	Number of patients	Lost from follow-up	Number of 5-year survivals: Without cancer	Number of 5-year survivals: With and without cancer
Group I	19	0	7 (37%)	13 (69%)
Group II	81	1	14 (17%)	18 (22%)
Group III	76	1	2 (3%)	10 (13%)
Total	176	2	23 (13%)	41 (24%)

TABLE 5.—*Radical Mastectomy (Operable Cases) With and Without Irradiation 1924-1941 (387 patients)**

Number of patients	Number of years	Survival: Without disease	Survival: With disease	Survival: Total, %
244	5	195 (50%)	49 (12%)	62
206	7	167 (43%)	39 (10%)	53
156	10	131 (34%)	25 (6%)	40

Lost from follow-up within 5 years: 20 patients (18 without disease).

Lost from follow-up between 5 and 7 years: 5 patients (all free of disease).

Lost from follow-up between 7 and 10 years: 14 patients (all free of disease).

Of the 387 patients treated between 1924 and 1941, there was a 96 per cent follow-up for 5 years and a 90 per cent follow-up for 10 years.

amine their breasts. Since the majority of breast cancers are painless, only by careful examination at regular intervals can the disease be diagnosed in its early stages.

The adoption of a uniform method of staging or classifying breast cancer will do much to clarify the confusion which now exists as to proper management and will eliminate unnecessary surgical measures in cases in which the lesion is far advanced.

The fact that a high percentage of five- and ten-year survivals without diseases can be obtained after the proper treatment should dispel a great deal of pessimism in the minds of both the laity and the profession. With this knowledge more patients will probably present themselves earlier and be urged to accept the indicated treatment.

SUMMARY AND CONCLUSIONS

1. Immediate radical operation is the treatment of choice for cancer confined to the breast.

2. Immediate radical operation with postoperative roentgen therapy is the treatment recommended for cancer of the breast with ipsilateral lymph node involvement, with or without local cutaneous involvement. With these methods of treatment the five- and ten-year results are encouraging.

3. In order to stage breast cancer properly and evaluate the results of treatment, a uniform method of staging must be adopted.

4. The importance of thorough histologic examination of all lymph nodes removed at operation is emphasized.

5. The recognition of early breast cancer can be greatly augmented by initiating an educational campaign beginning with girls in college or of college age, teaching them how to examine their breasts.

RESUME

1 L'operation radicale immediate est le traitement de choix pour le cancer limite au sein

2 L'operation radicale immediate avec irradiation postoperatoire est le traitement recommande pour le cancer de la mamelle avec extension aux nodes lymphatiques avec ou sans lesions cutanees

3 Avec les methodes de traitement cimentionnees, les resultats de 5 a 10 ans sont encourageants

4 Pour evaluer les resultats du traitement on doit adopter une methode uniforme de classification

5 L'importance d'un examen histiologique precis de tous les ganglions lymphatiques enleves au moment de l'operation est d'une extreme importance

6 L'importance d'une biopsie de tissu aspire, comme valeur diagnostique, est accentuee

7 Le cancer precoce du sein sera reconnu plus tot si on initie les jeunes filles de colleges ou d'age de college a la methode d'examiner leurs seins

RESUMEN Y CONCLUSIONES

1 La operacion radical inmediata es el tratamiento de eleccion para el cancer mamario localizado

2 La operacion radical inmediata con irradiacion postoperatoria es el tratamiento recomendado para el cancer mamario con complicacion linfoglandular ipsilateral, con o sin complicacion cutanea local

3 Con los metodos de tratamiento mencionados son alentadores los resultados a los cinco y diez años

4 Debe adoptarse un metodo uniforme en lo que atañe al "grado de progresion" del cancer mamario particularmente y la evaluacion de los resultados terapeuticos

5 Se señala la importancia del examen histologico de todas las linfoglandulas extirpadas en la operacion

6 Se describe la importancia de la biopsia aspiracion con fin diagnostico

7 El reconocimiento temprano del cancer mamario puede aumentar grandemente por una campañna educacional entre las colegialas o muchachas de su edad, enseñandolas a examinar sus mamas

RIASSUNTO

1 Nel cancro che si limita' alla mammella non c,e' da scegliere che l'operazione immediata e radicale

2 Operazione urgente e radicale con irradiazione post operativo e' il trattamento commendibile per cancro della mammella con complicazione ipsolaterale dei nodi linfatici sia con oppure senza manifestazione cutaneo

3 I risultati per 5 o 10 anni sono incoraggianti con i suddetti metodi

4 Un metodo uniforme di gradazione e' necessario nel cancro della mammella per apprezzare i risultati del trattamento

5 Pronunzia forte l'importanza del esame istologico perfetto di tutti nodi linfatici disgiunti

6 Descrive l'importanza della biopsia aspirativa come una misura diagnostica

7 Il riconoscimento precoce del cancro della mammella per mezzo di una campagna d'educazione per ragazze scollare, insegnando loro l'esame del petto

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1 Fuer auf die Brustdruese beschraenkte Krebse ist die unverzuegliche Radikaloperation die Behandlung der Wahl

2 Unverzuegliche Radikaloperation mit anschliessender Bestrahlung wird fuer Brustkrebse mit Beteiligung der Lymphknoten der gleichen Seite mit oder ohne Befallensein der Haut empfohlen

3 Die Ergebnisse nach fuenf und zehn Jahren sind bei Anwendung der oben erwaehnten Behandlungsmethoden ermutigend

4 Um eine sorgfaeltige Einteilung der Brustkrebse in Stadien und eine Auswertung der Behandlungsergebnisse zu ermoeglichen, ist es notwendig, eine einheitliche Methode der Kategorisierung anzunehmen

5 Die Wichtigkeit sorgfaeltiger histologischer Untersuchung aller operativ

entfernten Lymphknoten wird hervorgehoben.

6. Auf die Bedeutung des Probestichs mit Ansaugung als diagnostisches Hilfsmittel wird eingegangen.

7. Die Erkennung frueher Brustkrebse kann wesentlich erweitert werden durch Einfuehrung eines Erziehungsprogramms fuer junge Maedchen in Hochschulen oder im Hochschulalter, das sie lehrt, ihre Brueste zu untersuchen.

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Mediastinotomy

Some Technical Observations

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A SIMPLE method of mediastinotomy, easy to perform, must be considered most valuable in cases of endothoracic goiter, thymic tumors and other lesions in the anterior mediastinum, even though it must be admitted that the instances in which an endothoracic goiter cannot be brought forward through the aperture are extremely rare. A division of the goiter itself by means of morcellement should be avoided because it entails the risk of a hemorrhage that may be difficult to control, and further, on account of the lack of survey over the field of operation and the consequent risk of injury to other organs. The method introduced by Sauerbruch, consisting of a superior longitudinal division of the upper part of the sternum, does not provide satisfactory access, and closure may be very difficult.

A far better method is the one first introduced by the great Norwegian Johan Holst, consisting of an oblique osteotomy through the upper part of the sternum. Holst uses an asymmetric incision without dissection of a flap. I have somewhat modified this procedure, making a midline incision and dissecting a flap. The dissection of a flap provides a perfect view of the field of operation; the midline incision, moreover, gives the most satisfactory result from a cosmetic point of view.

The technic I employ is as follows: From the middle of the usual collar incision a midline incision is made over the sternum, cutting through to the bone; a triangular flap is dissected free on the side where the lesion is located (Fig. 1). A blunt dissection is performed under the upper lateral corner of the sternum, from the jugulum to the first intercostal space, and the vessels are pushed aside. A Gigli saw is introduced, and the upper lateral corner of the sternum is sawn off as described by Holst. The saw incision should extend from the middle of the jugulum to the lower margin of the first rib (Fig. 2). If wider access is wanted, an additional division of the second rib may be made, and if necessary the scalenus muscle may be divided, affording a great widening of the thoracic aperture.

Only one bone suture (as indicated in Fig. 2) is required for the closure of this mediastinotomy, in addition to some muscular sutures and stitches in the skin. Suture of the divided rib will not be necessary.

In exceptional cases this mediastinotomy may also be performed bilaterally if required.

The method here described does not constitute any serious complication of thyroidectomy and may well be performed under local anesthesia or under any other anesthesia that is best suited to the particular case. The bilateral operation will necessitate intratracheal anesthesia with facilities for overpressure and artificial respiration by means of a respiratory bag.

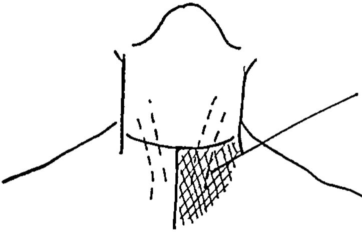

Fig. cisio mediastomy.

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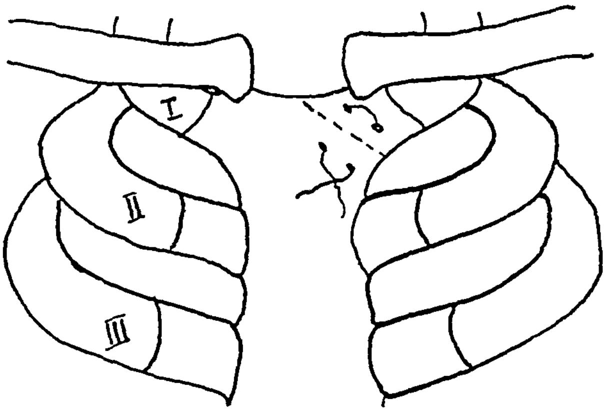

Fig. 2.—Mediastomy.

The procedure is a very simple one and technically easy to perform. It has proved most valuable in a number of cases in which it would otherwise have been extremely difficult to carry through the operation.

MEDIASTINOTOMIE
EINIGE TECHNISCHE BEMERKUNGEN

Eine einfache leicht ausfuehrbare Methode der Mediastinotomie muss als ein hoechst wertvolles Verfahren in Faellen von intrathorakalem Kropf, von Thymusgeschwuelsten und anderen Erkrankungen des vorderen Mediastinums angesehen werden, wenn auch zugegeben werden muss, dass es nur in seltenen Faellen unmoeglich ist, einen intrathorakalen Kropf durch die obere Brustoeffnung zutage zu bringen. Eine Zerteilung des Kropfes durch Zerstueckelung sollte wegen der Gefahr einer schwer kontrollierbaren Blutung und wegen der entstehenden Unuebersichtlichkeit des Operationsfeldes und des damit verbundenen Risikos, andere Organe zu verletzen, vermieden werden. Das Sauerbruchsche Verfahren, das in einer Laengsspaltung des oberen Teiles des Brustbeins besteht, verschafft keinen ausreichenden Zugang und ist mit grossen Schwierigkeiten der Schliessung des Einschnitts verbunden.

Eine wesentlich bessere Methode stellt das von dem grossen norwegischen Chirurgen Johan Holst eingefuehrte Verfahren dar, das in einer schraegen Durchschneidung der oberen Haelfte des Brustbeins besteht. Holst benuetzt einen unsymmetrischen Einschnitt ohne Ausschneidung eines Lappens. Ich habe dieses Verfahren durch Anwendung eines Einschnitts in der Mittellinie und Ausschneindung eines Lappens modifiziert. Die Lappenausschneidung gewaehrt einen vollkommenen Ueberblick ueber das Operationsfeld und der Mittellinienschnitt ergibt vom kosmetischen Standpunkt aus die guenstigsten Resultate.

Das von mir angewandte Verfahren wird folgendermassen ausgefuehrt: Vom Mittelpunkt des gewoehnlichen Kragenschnitts aus wird in der Mittellinie des Brustbeins eingegangen und der Knochen durchschnitten; auf der Seite der Erkrankung wird ein dreieckiger Lappen praepariert (Abb. 1). Unterhalb der oberen seitlichen Ecke des Brustbeins zwischen dem Jugulum und dem ersten Interkostalraum wird stumpf praepariert und die Gefaesse zur Seite geschoben. Dann wird eine Giglisaege eingefuehrt und die obere seitliche Ecke des Brustbeins in der von Holst beschriebenen Weise abgesaegt. Der Saegeschnitt soll sich von der Mitte des Jugulums bis zum unteren Rande der ersten Rippe erstrecken (Abb. 2). Wenn ein umfangreicherer Zugang erwuenscht ist, kann noch eine Durchschneidung der zweiten Rippe und noetigenfalls eine Durchtrennung des Scalenus ausgefuehrt werden, wodurch die obere Brustoeffnung erheblich erweitert wird.

Zur Schliessung der Mediastinotomie ist ausser einigen Muskel—und Hautnaehten nur eine einzige Knochennaht (siehe Abb. 2) erforderlich. Die durchschnittene Rippe braucht nicht genaeht zu werden.

Diese Mediastinotomie kann auch doppelseitig ausgefuehrt werden, wenn das in aussergewoehnlichen Faellen erwuenscht sein sollte. Das hier beschriebene Verfahren stellt keine ernste Komplizierung der Thyreoidektomie dar und laesst sich sowohl unter Lokalanaesthesie als auch unter jeder anderen fuer den

besonderen Fall geeignet erscheinenden Narkose mit Anwendung des Ueberdruckverfahrens und kuenstlicher Atmung mit Hilfe eines Atmungsbalges durchfuhren

MÉDIASTINOTOMIE
CONSIDERATIONS TECHNIQUES

Une methode facile d'ouverture du mediastin doit être appreciee dans les cas de goitre intra-thoracique, de tumeur du thymus, enfin d'autres lesions de la region anterieure du mediastin, il est cependant a noter que les circonstances sont rares ou un goitre intra-thoracique ne peut etre amene par une ouverture plus haute Il faut eviter d'extirper un goitre par morcellement a cause du danger grave d'hemorragie, de plus, le manque de vision et le danger de leser d'autres organes sont aussi presents La methode preconisee par Sauerbruch qui consiste a diviser longitudinalement la partie superieure du sternum n'offre pas une voie d'acces facile et de plus est difficle a fe'mer

Une methode preferee est celle mise d'avant par la norvegien fameux Johan Holst qui consiste a pratiquer en oblique une osteotomie de la partie superieure du sternum Holst pratique une incision asymetrique sans volet J'ai quelque peu modifie cette methode, en pratiquant une incision mediane et un volet Le volet donne unemeilleure vision du champ operatoire, l'incision mediane donne en plus un meilleur resultat esthetique

Voici en quoi consiste ma technique Partant de l'incision habituelle du cou, je pratique a mi chemin une incision mediane du sternum a travers l'os, un volet triangulaire est ensuite disseque largement de chaque cote de la lesion (Fig 1) Une dissection avec instrument mousse est continuee jusqua'aux angles du sternum, a partir de la jugulaire jusqu'au premier espace intercostal, les vaisseaux sont reclines de cote Avec une scie de Gigli, la partie superieure et laterale du sternum est sciee de la façon decrite par Holst Le trait de scie doit aller du centre de la jugulaire a la marge inferieure de la premiere cote (Fig 2) S'il fallait une ouverture plus grande, on peut sectionner la 2e cote, meme separer le scalene, donnant ainsi une plus grande ouverture de la cage thoracique

Sauf quelques points musculaires et a la peau, un seul point sur l'os est suffisant pour refermer le mediastin Il n'est pas necessaire de suturer les cotes sectionnees

A de rares exceptions, faut il pratiquer une incision bilaterale du mediastin

Cette methode ne complique pas la technique de la thyroidectomie, elle peut se faire sous anesthesie locale ou autre, telle que requise dans le cas particulier Si on doit pratiquer l'operation de deux cotes, il faut alors une anesthesie intra tracheale pour faciliter la respirationartificielle et la pression positive, ceci se peut au moyen du sac de caoutchouc

MEDIASTIONOTOMIA
DEGLI OSSERVAZIONI TECNICHE

Un metodo semplice di medistiontomia, facile ad effettuare, deve essere condiderato di valore importantissimo nei casi di gozzo intratoracico, tumori del timo, ed altre lesioni nel mediastino anteriore benche' bisogna ammettere che i casi di gozzo intratoracico che non si possano portar via traverso l'apertura siano estremamente rari Divisione del gozzo se' stesso per modo di "morcellement" dovrebbe essere evitato per causa dell' emorragia che puo' essere difficile a controllare, ed ancora a ragione della mancanza d'ispezione sul campo di operazione ed il rischio conseguente di danno ad altri organi Il metodo introdotto da sauerbach, consistendo di una divisione longitudinale superiore della porzione alta dello sterno, non provvede adito soddisfacente, e la chiusura puo'essere dilicile

Un metodo assai migliore e' quello primo introdotto dal grand Norvegese Johan Holst, consistendo in una ostectomia obbliqua traverso la superiore parte dello sterno Holst usa una incisione assimmetrica senza dissecazione del lembo Ho modificato un poco questo procedimento facendo una incisione linea media dissecando il lembo La dissecazione del

lembo provvede una perfetta veduta del campo operatorio; l'incisione linea-media, in oltre, da' risultato il piu soddisfacente dal punto di vista cosmetico.

La tecnica che impiego e' il seguente: Dal centro dell'incisione collare usuale una incisione linea-media e' fatta sopra lo sterno, tagliando traverso l'osso; un lembo triangolare si disseca libero al lato ove si colloca la lesione (Fig. 1). Dissecazione dura segue sotto l'angolo laterale superiore, dal giugulo al primo spazio intercostale, ed i vasi sono allontanati. La sega Gigli e' introdotto, e l'angolo laterale superiore e' segato giu' come descritto da Holst. L'incisione della sega dovrebbe stendere dal centro del giugulo alla margine inferiore della prima costola (Fig. 2). Se accesso piu' largo sia mancante, divisione addizionale della seconda costola si puo' fare, e se necessita' il muscolo scaleno si puo' dividere, permettendo piu' larghezza all'apertura toracica.

Solamente una sutura all'osso (come indicato nella Fig. 2) bisogna per la chiusura di questa mediastionotomia, in aumento di suture muscolare e nella pelle. Sutura della costola divisa non e' necessario.

Nei casi eccezionale questa mediastinotomia si puo' completare anche bilaterale.

Il metodo qui descritto non constituisce complicazioni gravi di tiroidectomia e si puo' eseguire bene sotto anestesia locale o con qualche altra anestesia convenevole al caso particolare. L'operazione bilaterale necessitera' anestesia intratracheale che con apparecchio per alta pressione e respirazione artificiale per mezzo di sacca respiratoria.

MEDIASTINOTOMÍA—ALGUNAS OBSERVACIONES TÉCNICAS

Un simple método de mediastinotomía, fácil de efectuar, debe considerarse muy valioso en casos de bocio endotoráxico, tumores tímicos y otras lesiones del mediastino anterior, aun cuando debe admitirse que son extremadamente raros los ejemplos en que un bocio endotoráxico no puede ser atraido por la abertura. Debe evitarse la división del bocio por despedazamiento porque entraña el riesgo de una hemorragia difícil de cohibir, además del obscurecimiento del campo operatorio y el riesgo consiguiente de lesionar otros órganos. El método introducido por Sauerbruch, consistente en una división longitudinal superior de la parte superior del esternón, no proporciona acceso satisfactorio y el cierre puede ser muy difícil.

Un método mucha mejor es el primero introducido por el gran noruego Johan Holst, consistente en una osteotomía oblícua por la parte superior del esternón. Holst usa una incisión asimétrica sin disección del colgajo. La disección de un congajo proporciona visión perfecta del campo operatorio, dando además la incisión mediana ele resultado más satisfactorio desde el punto de vista cosmético.

La técnica que empleo es la siguiente: Partiendo de la mitad de la incisión en collar ordinaria se hace una incisión mediana sobre el esternón, cortando el hueso se hace la disección de un colgajo triangular libre sobre el lado en que la lesión está localizada (Fig. 1). Se efectúa una disección roma bajo el ángulo lateral superior del esternón, desde la horquilla al primer espacio intercostal, rechazando lateralmente los vasos. Se introduce una sierra de Gigli y se asierra el ángulo lateral superior del esternón en la forma descrita por Holst. Podrá extenderse la incisión de la sierra desde la mitad de la horquilla al borde inferior de la primera costilla (Fig. 2). Si se desea acceso más amplio, puede hacerse una división adicional de la segunda costilla y en caso necesario puede dividirse el músculo escaleno, proporcionando una gran amplitud a la abertura toráxica.

Solamente una buena sutura ósea (Fig. 2) se requiere para el cierre de esta mediastinotomía, en adición a algunas suturas musculares y puntos cutáneos.

REFERENCE

Hertz, J.: On Goiter and Allied Diseases, Especially Thyrotoxicosis, with Particular Reference to the Surgical Treatment. Copenhagen, and London, 1943.

Carcinoma of the Cervical Stump

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DAVID W OVITT, MD, FACS
MILWAUKEE

THE incidence of carcinoma of the cervical stump in a private general hospital has been studied, and records of cases of subtotal hysterectomy have been compared with those of total hysterectomy. The results of investigations appear to confirm the growing belief[1] that total hysterectomy is the operation of choice unless special contraindications exist; this is contrary to the too prevalent teaching that supracervical hysterectomy should be done unless there are definite indications for a total operation.

Estimation of the incidence of carcinoma of the cervical stump is difficult, as different criteria are used for measuring the length of time that must elapse between supracervical hysterectomy and the development of a true carcinoma of the cervical stump. Pathologists are not agreed as to the "time-table" of the events leading up to a full-blown carcinoma. Consequently, clinicians have used various arbitrary periods to distinguish between true carcinomas of the stump and carcinomas of the cervix which were present but not diagnosed at the time of supracervical hysterectomy.

In our opinion all cancers of the cervical stump should be recorded, but that they should be divided into three groups. The first should include only those discovered in the first year after supracervical hysterectomy; these were undoubtedly present but undiagnosed at the time of operation. The second group would include those appearing in the second and third years after supravaginal hysterectomy; these were probably present at the time of the original operation but could have been diagnosed only by special cytologic examination. The third group, developing three years or more after operation, can be considered as true primary carcinomas of the cervical stump.

Number of Cases.—In St. Mary's Hospital, Milwaukee, between 1940 and 1950 there were 92 cases of cancer of the cervix, of which 18 were cases of cancer of the cervical stump. Of the latter, 3 were discovered in the first year and 2 in the second and third years. Thirteen fulfilled our criteria for true carcinoma of the cervical stump, having shown no symptoms within the first three years after supracervical hysterectomy. This group of 13 true stump carcinomas makes up 14.1 per cent of all cases of cancer of the cervix observed in this ten-year period. These cancers of the cervical stump developed from three to thirty-five years after supracervical hysterectomy, with an average of eleven years for the 13 cases.

Of interest is still another case, not included in these figures, in which a leiomyosarcoma of the cervical stump occurred in a woman who had undergone supracervical hysterectomy four years previously for the same condition in the fundus.

During the same ten-year period 1,161 supracervical hysterectomies were done in St. Mary's Hospital. To determine the exact future incidence of carcinoma of the stumps left behind at these operations would require many years of careful follow-up.

Percentages.—In many cases, carcinoma of the cervical stump is discovered in hospitals other than the ones in which the supravaginal hysterectomies were done. We have assumed that St. Marys would *pick up as many of these cases as it would* lose and have compared the number of our cases of stump cancer (13) to the total number of supravaginal hysterectomies (1,161). This assumption, though not statistically sound, gives us an expected incidence of 1.1 per cent. This figure is

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about the same as those reported in actual follow-up series in the literature.[2]

Our figures, which show that 14 per cent of all cancers of the cervix develop in a remaining cervical stump, are higher than is usually reported.[1e] All such figures, however, are sufficiently high to indicate that complacency toward supracervical hysterectomy is unjustified and that the obvious prophylactic procedure of complete hysterectomy should be done whenever possible. Our textbooks and teachers should discuss the danger as well as the uselessness of a retained cervical stump. It should be emphasized that if there is an indication for hysterectomy an incomplete operation would not have to be justified by technical difficulties of such magnitude as would definitely endanger the patient. This may seem a radical departure from present-day teachings, but it is such a logical step toward reducing the incidence of cancer of the cervix that it can no longer be ignored.

Surgical Risks. — In order to justify complete rather than supravaginal hysterectomy as the routine procedure of choice whenever hysterectomy is indicated for benign lesions we should be able to dispel the bugaboos of higher mortality, higher morbidity and greater incidence of ureteral injuries. It is our contention that since the advent of blood banks, antibiotics, sulfonamides and better surgical training there is too little difference between the two operations in any of these figures to justify retention of the incomplete operation. Recently published figures (Table 1) show little difference between the operations, but since these generally come from university clinics we decided that it would be instructive to study the morbidity, mortality and frequency of ureteral injuries in a general hospital in contrast to those reported by an individual surgeon or a small group of surgeons.

TABLE 1.—*Comparative Mortality Rates*

Author	No. of operations (all abdominal)	Mortality, %	
		Total Abdominal	Supravaginal
Dupertuis and Zohlinger 1938	514		1.7
	118	2.8	
Masson Mayo Clinic 1940	766		0.9
	1766	1.2	
Miller and Prejean 1941	255		2.75
	374	1.33	
TeLinde Johns Hopkins 1942	663		0.15
	152	0	

There were 309 supracervical hysterectomies and 176 complete abdominal hysterectomies done at St. Mary's Hospital between Jan. 1, 1948, and Sept. 1, 1950. These were studied as to mortality, morbidity and operative complications. The results are shown in Table 2. It is readily apparent that mortality and morbidity figures show little difference between the two groups of cases. The ureteral injuries would probably have occurred if the surgeons had done complete hysterectomies. Not shown in the table but of interest in cancer prevention are 2 cases of unsuspected adenocarcinoma of the cervix, 2 of endometrial carcinoma, and 5 of cystoadenocarcinoma of the ovary which were discovered by the pathologist in patients treated by supracervical hysterectomy, an operation which is most unsatisfactory in dealing with cancer. In similar vein, there was 1 unsuspected Stage 1 carcinoma of the cervix and 1 carcinoma *in situ* of the cervix subsequently diagnosed by the pathologist in the group of complete hysterectomies. Our mortality percentage of less than 1 per cent for either supravaginal hysterectomy or total hysterectomy compares favorably with recently published figures as shown in Table 1, in which the mortality for the total operation varies from 0 to 2.8 per cent and that for the subtotal from 0.15 to 2.75 per cent. It is worthy of note that the later the figures the less mortality, which indicates progressive improvement in surgical technic. Certainly there is no significant difference.

How, then, can we justify permitting the cervix to remain? It is argued by some

TABLE 2.—*Data from St Mary's Hospital (Jan. 1, 1948, to Sept. 1, 1950)*

Operation	No.	Mortality, %	Morbidity (days temp. 100.4)	Post op. hosp. days	Ureteral injuries
Supravaginal hysterectomy	309	0.647	1.236	10.854	3
Total Abdominal hysterectomy	176	0.568	1.280	10.08	0

that it is necessary for support of the vagina; however, these same surgeons, when operating for uterine prolapse when all supports are gone, commonly do a complete hysterectomy, albeit from below. It is claimed that the complete operation results in shortening of the vagina; in our personal series this has not been true, and the patients have unanimously stated that when intercourse was satisfactory before the operation it was equally so afterward. In addition, a cervical stump may actually cause dyspareunia, and these cervical stumps represent an actual as well as potential source of continuing infection which is very difficult to eradicate short of trachelectomy.[3]

Choice of Operation.—What, then, should be our procedure in performing hysterectomy for benign conditions? The technically difficult part of a hysterectomy has been completed when the ligaments and arteries of the uterus have been ligated and divided. Further careful dissection downward close to the cervix and a slight prolongation of operating time are all that are needed to change a subtotal to a total hysterectomy. Modern antibiotics and the sulfonamides have eliminated the added hazard formerly involved in opening the vaginal vault. Is the extra time and effort required for a total hysterectomy justified in order to prevent the 10 (approximately) cervical cancers which follow each 1,000 supravaginal hysterectomies? We believe that it is, although we concede that it may be necessary to make a rare exception to this rule.

Certainly it would seem obvious that in those cases in which only a supravaginal hysterectomy is done the cervix should be not only carefully examined but as a rule curetted and subjected to biopsy in order to avoid the possibility of leaving behind an already existent but unsuspected carcinoma. Similarly, every fundus removed should at once be opened in the operating room and examined for carcinoma, because in the presence of this neoplasm, with its well known direct extension via the lymphatics and by contiguity, there can be no compromise or halfway measure; this is an absolute indication for removal of the cervix.

If one elects to do supravaginal hysterectomy in some cases and total hysterectomy in others, where should the dividing line be drawn? In this series of 13 cases of stump cancer previous child-bearing could not be used as a guide. In only 9 of the cases was the history as to pregnancies given; 5 patients had never been pregnant; 2 had had one pregnancy, and 2 had had two pregnancies. Even assuming that the remaining 4 had had children, this would not be much different from the percentage for the average female population. The other 5 cases in which the carcinoma may have been present at the time of the original operation showed a similar picture: 2 patients had not been pregnant, 1 had 2 children, 1 had 3 and the other had 10. These figures are substantially the same as those of Meigs,[4] who in 26 cases of true stump cancer reported 6 patients with no pregnancies and 12 with one pregnancy. In 32 cases of cervical cancer developing within three years after supravaginal hysterectomy, he reported that 13 patients had never been pregnant; 1 had had 1 pregnancy with about the same as those reported in actual follow-up series in the literature.[2]

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old enough to be of any statistical significance In the literature, however (Table 3), the five year cures of stump carcinomas seem at least as good and in some cases better than in routine cases of carcinoma of the cervix Some of the differences may be explained on the basis of the types of tumor included in the different series Those which include all carcinomas of the cervix, regardless of the time elapsing between supravaginal hysterectomy and the development of cervical symtoms, showed a much lower salvage rate Behney[16] pointed out that those in which symptoms developed three to ten years after supravaginal hysterectomy had the best prognosis, while those in which the symptoms made their appearance within the first year had the worst

SUMMARY AND CONCLUSIONS

Fourteen per cent of the tumors in all cases of carcinoma of the cervix in a private hospital during the last ten years have been identified as carcinoma of the cervical stump left after supravaginal hysterectomy performed more than three years previously It is estimated that carcinoma will eventually develop in 1 1 per cent of all such cervical stumps

The mortality, morbidity and incidence of ureteral injuries associated with supravaginal hysterectomy as compared with total abdominal hysterectomy since Jan 1, 1948, have been statistically studied in the same hospital and no significant differences noted Methods of treatment are mentioned to show that treatment is not standardized and to indicate that the prognosis of carcinoma of the cervical stump is essentially the same as that of carcinoma of the cervix when the uterus is intact

Support is therefore given to the increasing number of those who maintain that total hysterectomy is the operation of choice and supravaginal hysterectomy the exception in the surgical treatment of benign lesions of the uterus

RESUME

14% des tumeurs dans tous les cas de carcinome du col uterin operes dans un hopital prive durant les dernieres 10 annes furent reconnues comme carcinome du moignon cervical suivenant apres hyterectomie supravaginale faites plus de trois ans avant L'auteur estime que le carcinoma se developpe eventuellement dans 1% de tous ces moignons cervicaux

La mortalite la morbidite et l'incidence de lesions de l'uretere *associes avec l hysterectomie* supravaginale comparee avec l'hysterectomie totale abdominale depuis le Ier Janvier 1948 ete etudiees dans le meme hopital, on n'a observe aucune difference signifiacature Les methodes de traitement ont ete mentionnees pour montrer que le traitement n'est pas standardise et pour indiquer que le pronostic du carcinome du moignon cervical est essentiellement le meme que celui de carcinome du col quand l'uterus est intact

Un grand nombre de chirurgiens maintiennent que l'hysterectomie totale est l'operation de choix et l'hysterectomie supravaginale l'exception, dans le traitement chirurgical des lesions benignes de la matrice

RESUMEN Y CONCLUSIONES

Catorce por ciento de los tumores de todos los casos del carcinoma de la cerviz en un hospital particular durante los diez años pasados fueron identificados como carcinoma *del tocon cervical dejado* despues de la histerectomia supravaginal *ejecutada tres años anteriormente* Se calcula que un carcinoma se desenvolvera *finalmente* en 1 1 por ciento de todos los casos con tocon de la cerviz dejado despues de la operacion

La mortalidad, la morbidez y la incidencia de los daños uretrales associados con la histerectomia supravaginal comparadas cen las de las histerectomias abdominales totales desde el primo enero 1948 fueron examinadas estadisticamente en el mismo hospital, las diferencias *no* fueron significativas Los metodos del tratamiento son mencionados *para indicar*

Congenital Atresia of the Jejunum with Meconium Peritonitis

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PHILADELPHIA

THIS case is reported because of the following interesting features: 1. Atresia of the jejunum with complete separation of the proximal and distal segments of the bowel. This was corrected successfully by surgery. 2. Complicating meconium peritonitis, due to a perforation of some duration in the region of the proximal end of the distal segment of bowel. This was apparently the result of an infarction substantiated by microscopic examination of the resected specimen of bowel.

REPORT OF CASE

A white girl aged 20 hours was admitted to the Valley Forge General Hospital on Oct. 13, 1948. The delivery had been entirely uneventful. The weight at birth was 8 pounds and 7 ounces (3.8 Kg.). Several hours later the infant vomited a few times but this was not thought to be particularly abnormal. It persisted throughout the following day, with vomiting and regurgitation after each attempt at feeding. The vomitus was bile stained and remained so throughout. The parents became alarmed and, after consulting their local doctor, took the infant to a pediatrician in a nearby community. He examined the child and took a flat plate of the abdomen. He felt that there was evidence of intestinal obstruction and advised hospitalization. Since the father was a patient at the Valley Forge General Hospital because of severe war injuries, the infant was taken there for further care.

At the time of admission the infant was still in good general physical condition. The weight was 8 pounds 5 ounces (3.75 Kg.). The rectal temperature was 99.2 F. There was only slight evidence of dehydration. The abdomen was moderately distended, with no peristalsis visible. There had been no passage of stool since birth. The white blood cell count on admission was 5,000 per cubic millimeter, with a differential count of 60 per cent neutrophils, 38 per cent lymphocytes and 2 per cent monocytes. The value for hemoglobin was 21.2 Gm. A catheterized urine specimen gave negative results for sugar and albumin; the specific gravity was 1.024.

The patient was typed and cross-matched for a blood transfusion. A flat plate of the abdomen was taken and compared with the film taken previously. There had been an obvious increase in the number of gas-filled loops of bowel during the four hours elapsing between films, and it was also noted that the loops were concentrated in the left upper quadrant of the abdomen. The roentgenologist expressed the opinion that this indicated an obstruction somewhere in the midportion of the jejunum. He also noted that on two of the films faint calcified lines could be seen, which shifted with change in position, and that these might well suggest meconium peritonitis. A diagnosis of intestinal obstruction, probably due to a congenital malformation, was made.

Before the child was taken to the operating room a vein in the region of the left ankle was exposed and 50 cc. of 5 per cent dextrose in physiologic solution of sodium chloride was given very slowly. At the same time a small catheter was passed to the stomach via the nostril and the stomach contents were aspirated.

Operation was carried out approximately two hours after admission. An endotracheal anesthetic was administered. During the operative procedure a blood transfusion of 200 cc. was given. Special care was taken to preserve the body heat of the infant.

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The abdomen was entered through a left upper abdominal pararectus incision. When the peritoneum was opened, distended small bowel immediately bulged into the field A considerable amount of pale yellow putty-like material was lying free in the peritoneal cavity and was removed. It was thought to be meconium. Collapsed bowel was also seen and brought up into the field. The caliber of this bowel was about 1 cm. It was then traced back for a considerable distance proximally and was found to end blindly in a loop bent sharply back on itself, the lumen of which appeared to be at least partially open.

There was marked injection at this site, and a considerable amount of the same light yellow putty-like material was adherent to the mesentery and the adjacent bowel. The distended bowel was then examined and found to end blindly a short distance distal to the ligament of Treitz. At this point it was about 4 cm. in diameter. The entire collapsed bowel was then examined carefully and traced back to the ileocecal valve. The appendix was not seen. The colon was also examined and palpated. Apparently there were no other abnormalities present. The collapsed and distended terminal portions of the bowel were distinct from each other, and there was no intervening mesentery. These were placed opposite each other and a side-to-side anastomosis carried out. A posterior layer of continuous No. 0000 atraumatic chromic catgut was placed to unite the serosal surfaces. The bowel lumen was then entered and the contents aspirated, a considerable amount of liquid and foul-smelling gas being removed from the distended proximal loop. The entire thickness of both bowel walls was then approximated by a continuous No. 0000 atraumatic chromic catgut locking suture, which was carried around anteriorly and the bowel walls inverted, a Connell suture being used. Each stomal angle was then reinforced by several interrupted sutures of the same material. The anastomosis was carried out about 14 cm. distal to the termination of the collapsed bowel. Owing to the marked inflammation and the presence of meconium in this region it was felt advisable to resect this terminal portion of the bowel. This was carried out, a segment of bowel 9 cm. in length being removed. The bowel was then returned to the peritoneal cavity and the abdomen closed in layers without drainage. Penicillin (50,000 units in physiologic solution of sodium chloride) was placed in the peritoneal cavity prior to closure.

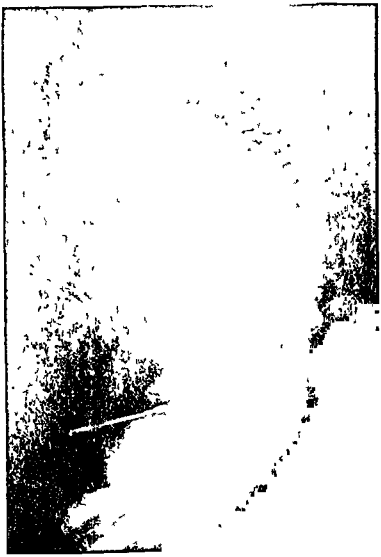

Fig. 1. — Roentgenogram taken on admission, showing gas-filled loops of bowel occupying the left upper quadrant of the abdomen.

The patient was placed in an oxygen tent immediately after operation, and continuous gastric suction was instituted via the nasal catheter. Penicillin (15,000 units) was given intramuscularly every three hours. The position was changed frequently and the throat aspirated of mucus as necessary. A continuous slow drip of 6 to 8 drops a minute was maintained intravenously, and in the twenty-four hours after operation 100 cc. of 5 per cent dextrose and saline, 300 cc. of 5 per cent dextrose and water, and 50 cc. of sixth-normal sodium lactate were given. Vitamin C (100 mg.) was also given intramuscularly every day.

The postoperative course was smooth and uneventful. A watery green stool was passed forty-eight hours after operation and hourly thereafter for about twelve hours. It was felt that this was a good omen and indicated a return of active peristalsis.

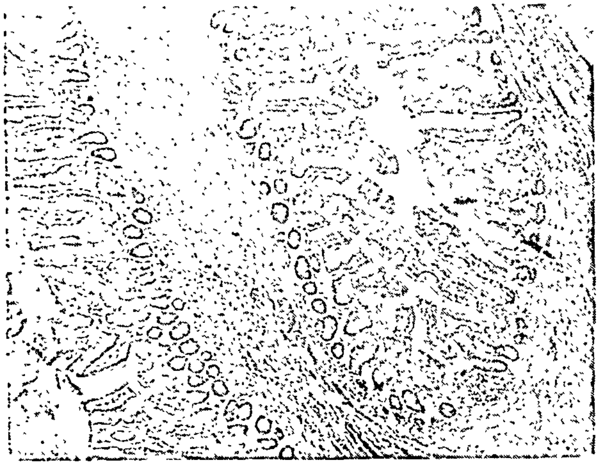

Fig. 2.—Microscopic section showing uninvolved segment of the resected small bowel.

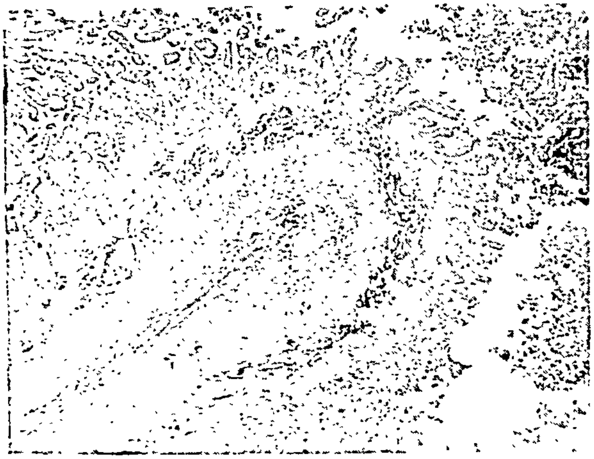

Fig. 3.—Microscopic section showing infarcted segment of resected small bowel.

The gastric suction and use of the oxygen tent were discontinued after seventy-two hours. The penicillin was discontinued on the sixth postoperative day. Feedings were given intravenously for the first seventy-two hours, and then a formula was instituted in gradually increasing amounts, until by the tenth postoperative day 4 ounces were being given six times daily. The diagnosis as reported by the pathologist after examination of the resected bowel was congenital atresia of the small intestine, associated with infarction. Microscopically there was a marked transition from essentially normal intestine to the infarcted area with marked hyalinization and deposits of hemosiderin.

The patient was discharged from the hospital on November 2, nineteen days after the operation. At the time of discharge the weight was 8 pounds 11 ounces (3.9 Kg.). The stools were normal in consistency and color. The child was taking her feedings very well. She was followed regularly in the pediatric outpatient clinic, and when last seen in May 1949 her weight was 22 pounds (10 Kg.). At that time her father had been returned to duty and was leaving for service overseas. A letter from the mother, received within the past three months, states that she is in all respects a normal healthy child. The photograph shows the patient in May 1949, a little over six months after her operation.

Incidence.—How often is this condition encountered? If imperforate anus is excluded—which, according to Davis and Poynter,[1] is four times as frequent as all other types of atresia—the usual incidence in the intestinal canal as given by various authors is about 1 in 20,000 births. In about 15 per cent of these the defects are multiple and beyond surgical aid except in rare instances. Only very recently has the condition been reported as handled successfully. In the majority of cases the atresia is located in the duodenum, occurring in the colon in only 1 case in 10. Complete atresia is much more rare than partial obstruction and is most frequently observed in the duodenum at the level of the ampulla. The next most frequent site is the lower part of the ileum. In one fairly large series of cases 44 per cent were located in the duodenum, 18 per cent in the jejunum, and 38 per cent in the ileum. Multiple defects are most often found in the jejunum and ileum, stenosis and atresia frequently coexisting.

Cause.—Most of the embryologic events associated with the development of the intestine take place between the fifth and the tenth week of fetal life. Just prior to the fifth week the intestine has a patent, well defined lumen lined with epithelium. The epithelium proliferates rapidly shortly after this, and the lumen then becomes obliterated. The solid stage persists for a short time after which vacuoles appear and coalesce rapidly to reestablish the intestinal lumen permanently by the twelfth week of fetal life. An arrest in development at one or more points during this period results either in an atresia or in stenosis of the intestine In atresia there may be a complete lack of continuity with a blind end, or a remaining imperforate septum In stenosis there may be a remaining but perforated septum The intestine above the point of obstruction becomes dilated, while that below remains collapsed In cases of atresia the intestine below the point of obstruction has the appearance of a small cord, although all the normal elements are present, including a lumen The lumen which has never been dilated by amniotic fluid remains only large enough to admit a small probe In stenosis the intestine below the point of obstruction remains small but not as small as in atresia Extrinsic obstructions may be due to congenital abnormalities, such as annular pancreas or an abnormal twisting of the mesentery of the bowel due to faulty rotation According to Bowers and Titrud,- Forssner has classified atresia of the intestine into three types In the first there is a mucosal membrane occluding the lumen of the bowel, which may be complete or incomplete In the second there is a cord connecting the proximal and distal segments of the bowel which is composed of serosa, muscularis and submucosa In this type the mesentery is usually present but atrophic In the third, there are two separate segments of intestine which may be a varying distance apart, and the mesentery may be entirely absent

Pathologic Picture —In a complete obstruction the proximal bowel is characterized by marked distention and thinning of the walls The distal bowel is very small because it has never been subjected to the hydrostatic dilatation of amniotic fluid In an incomplete obstruction the proximal bowel is grossly more thick than normal but only moderately distended The distal bowel is relatively collapsed, but the lumen approaches the normal in caliber Death in cases of intestinal atresia usually is due to inanition resulting from a combination of vomiting, dehydration and alkalosis The greatly distended proximal bowel also frequently ruptures, with death resulting from generalized peritonitis

History and Symptoms —The predominant symptoms are pain, vomiting and lack of stools, with vomiting as the most outstanding early symptom In most cases, the earlier the vomiting appears the higher the level of the obstruction Absence of meconium indicates a relatively low obstruction, and absence of bile pigments places the lesion below the ampulla of Vater or else indicates a congenital malformation of the bile passages The presence of blood or coffee ground material in the vomitus usually indicates atresia or stenosis of the duodenum

Physical Examination —Abdominal distention is usually present in a greater or lesser degree, but it is not of great diagnostic significance In cases of high atresia it tends to be limited to the upper part of

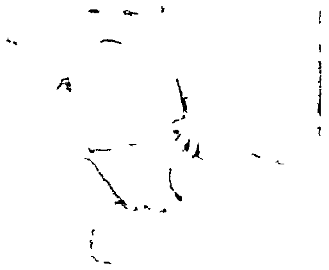

Fig 4 —Patient approximately six and one half months after the operation

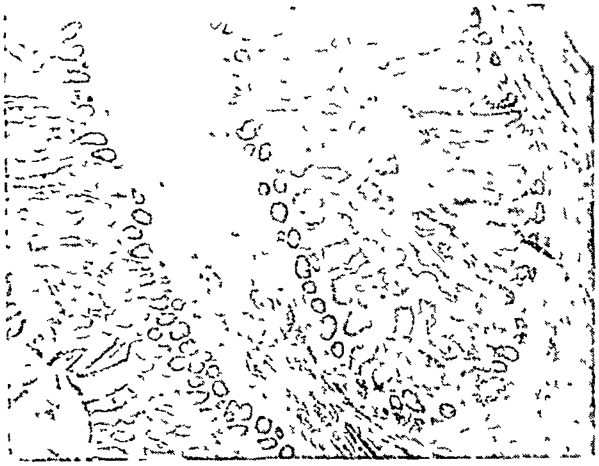

Fig. 2.—Microscopic section showing uninvolved segment of the resected small bowel.

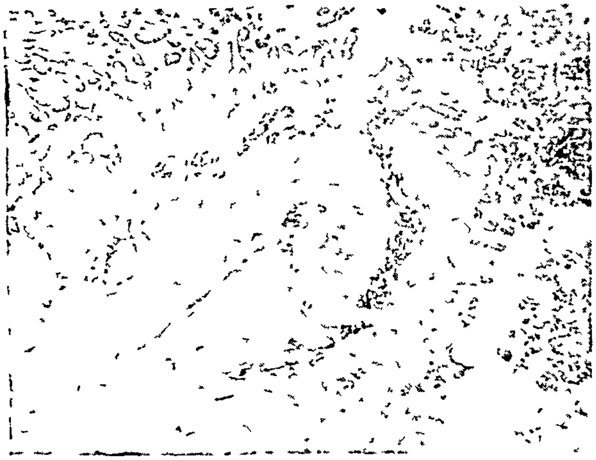

Fig. 3.—Microscopic section showing infarcted segment of resected small bowel.

The gastric suction and use of the oxygen tent were discontinued after seventy-two hours. The penicillin was discontinued on the sixth postoperative day. Feedings were given intravenously for the first seventy-two hours, and then a formula was instituted in gradually increasing amounts, until by the tenth postoperative day 4 ounces were being given six times daily. The diagnosis as reported by the pathologist after examination of the resected bowel was congenital atresia of the small intestine, associated with infarction. Microscopically there was a marked transition from essentially normal intestine to the infarcted area with marked hyalinization and deposits of hemosiderin.

The patient was discharged from the hospital on November 2, nineteen days after the operation. At the time of discharge the weight was 8 pounds 11 ounces (3.9 Kg.). The stools were normal in consistency and color. The child was taking her feedings very well. She was followed regularly in the pediatric outpatient clinic, and when last seen in May 1949 her weight was 22 pounds (10 Kg.). At that time her father had been returned to duty and was leaving for service overseas. A letter from the mother, received within the past three months, states that she is in all respects a normal healthy child. The photograph shows the patient in May 1949, a little over six months after her operation.

Incidence.—How often is this condition encountered? If imperforate anus is excluded—which, according to Davis and Poynter,[1] is four times as frequent as all other types of atresia—the usual incidence in the intestinal canal as given by various authors is about 1 in 20,000 births. In about 15 per cent of these the defects are multiple and beyond surgical aid except in rare instances. Only very recently has the condition been reported as handled successfully. In the majority of cases the atresia is located in the duodenum, occurring in the colon in only 1 case in 10. Complete atresia is much more rare than partial obstruction and is most frequently observed in the duodenum at the level of the ampulla. The next most frequent site is the lower part of the ileum. In one fairly large series of cases 44 per cent were located in the duodenum, 18 per cent in the jejunum, and 38 per cent in the ileum. Multiple defects are most often found in the jejunum and ileum, stenosis and atresia frequently coexisting.

Cause.—Most of the embryologic events associated with the development of the intestine take place between the fifth and the tenth week of fetal life. Just prior to the fifth week the intestine has a patent, well defined lumen lined with epithelium. The epithelium proliferates rapidly shortly after this, and the lumen then becomes obliterated. The solid stage persists for a short time after which vacuoles appear and coalesce rapidly to reestablish the intestinal lumen permanently by the twelfth week of fetal life. An arrest in development at one or more points during this period results either in an atresia or in stenosis of the intestine. In atresia there may be a complete lack of continuity with a blind end, or a remaining imperforate septum. In stenosis there may be a remaining but perforated septum. The intestine above the point of obstruction becomes dilated, while that below remains collapsed. In cases of atresia the intestine below the point of obstruction has the appearance of a small cord, although all the normal elements are present, including a lumen. The lumen which has never been dilated by amniotic fluid remains only large enough to admit a small probe. In stenosis the intestine below the point of obstruction remains small but not as small as in atresia. Extrinsic obstructions may be due to congenital abnormalities, such as annular pancreas or an abnormal twisting of the mesentery of the bowel due to faulty rotation. According to Bowers and Titrud,[2] Forssner has classified atresia of the intestine into three types. In the first there is a mucosal membrane occluding the lumen of the bowel, which may be complete or incomplete. In the second there is a cord connecting the proximal and distal segments of the bowel which is composed of serosa, muscularis and submucosa. In this type the mesentery is usually present but atrophic. In the third. there are two separate segments of intestine which may be a varying distance apart, and the mesentery may be entirely absent.

Pathologic Picture.—In a complete obstruction the proximal bowel is characterized by marked distention and thinning of the walls. The distal bowel is very small because it has never been subjected to the hydrostatic dilatation of amniotic fluid. In an incomplete obstruction the proximal bowel is grossly more than normal but only moderately dilated. The distal bowel is relatively small but the lumen approaches the normal caliber. Death in cases of intestinal atresia usually is due to inanition [illegible]

a combination of vomiting, dehydration and alkalosis. The greatly distended proximal bowel also frequently ruptures with death resulting from generalized peritonitis.

History and Symptoms.—The predominant symptoms are pain, vomiting and lack of stools, with vomiting as the most outstanding early symptom. In most cases, the earlier the vomiting appears the higher the level of the obstruction. Absence of meconium indicates a relatively low obstruction, and absence of bile pigments places the lesion below the ampulla of Vater or else indicates a congenital malformation of the bile passages. The presence of blood or coffee ground material in the vomitus usually indicates atresia or stenosis of the duodenum.

Physical Examination.—Abdominal distention is usual[illegible] pre[illegible] in a greater or lesser degree, but it i[illegible] of great diagnostic significa[illegible]. In ca[illegible] [illegible] it tends to be l[illegible]ted to t[illegible] [illegible] part of the abdomen. If the atresia is low, it may be limited to the horseshoe-shaped area conforming to that occupied by the large bowel, because the ileocecal valve is normally competent and prevents retrograde distention of the small bowel. Atresia of the duodenum has been seen to cause such marked gastric dilatation that the stomach fills the entire peritoneal cavity. It also must be remembered that the bowel segments do not necessarily occupy their normal positions in the peritoneal cavity. The prominent features are abdominal distention, visible peristalsis or coils of intestine, evidence of shock, dehydration and alkalosis. Peristaltic waves passing from left to right are frequently seen during the examination.

Roentgen Examination.—The roentgen ray is of the greatest value in making a diagnosis as well as in localizing the area of atresia. A simple flat plate of the abdomen is often all that is necessary to demonstrate the extent and location of the distention with striking clearness. Barium, if used at all, should be administered cautiously and in small amounts, because it may easily convert stenosis into complete obstruction. A number of authors[3] have frowned on the use of barium, stating that the dangers, particularly from tracheobronchial aspiration far outweigh the advantages. It is recommended that roentgenograms be taken with the patient upright rather than prone. Widely distended loops of bowels showing fluid levels will be seen if an obstruction is present. One can usually tell whether the obstruction is high or low, but positive localization is not often possible because of the enormous dilatation present and the crowding of loops into abnormal positions.

Differential Diagnosis.—The only real problem in diagnosis is to differentiate this condition from congenital hypertrophic pyloric stenosis. This occurs most often in boys and in the firstborn child in the family. The onset of vomiting rarely occurs at birth but usually appears during the second to the sixth week. Stenosis or atresia, by contrast, causes severe symptoms usually within a matter of hours to two or three days. Esophageal stricture causes immediate regurgitation on attempts at feeding, and there is little or no abdominal distention. If there should be an accompanying tracheal fistula, cyanosis follows any attempt at feeding.

Prognosis.—The following is quoted from an article by John Morley,[4] "Congenital Occlusion of the Ileum", which appeared in July 1921 in Vol. IX of the *British Journal of Surgery:*

> "The idea of restoring the continuity of the gut by anastomosis of the dilated proximal bowel with the collapsed bowel distally must be set aside as futile. The tiny contracted bowel with a lumen that will only admit a probe can never discharge its proper function. The anastomosis has been attempted several times but has had to be abandoned or has failed in every case."

The prognosis has changed considerably, and the outlook is now much brighter. Even at that time several successful cases had been reported in the literature, the first being that of Fockens[5] in 1911. He operated on an infant eight days after birth. There was complete absence of the ileum for several inches in the midportion, the structure being represented only by a fibrous cord along the free margin of the mesentery. A lateral anastomosis was made around this defect, and an uneventful recovery followed. A second successful case was reported by Ernst[6] in 1916. He operated on an infant eleven days after birth, at a time when excessive vomiting had led to severe dehydration. Atresia of the duodenum in the distal half was observed and corrected by a duodenojejunostomy through an opening in the transverse mesocolon. Improvement after the operation was rapid, and a year and a half later the child was reported as perfectly well. However, prior to 1927 only 4 cases of atresia of the intestine had been reported in the literature as successfully treated by surgical intervention. Webb and Wangensteen[3a] in 1931 reviewed some 500 cases of atresia and found only 9 survivals. In 1941, Cohen[7] estimated that another 150 cases had been reported and that there were over 50 recorded instances of successful surgical treatment. Tribute must be paid to the work of Ladd and Gross[8] in this field. They have had the largest series. In their book "Abdominal Surgery of Infancy and Childhood" they have a series of 74 cases with 17 recoveries. Undoubtedly there have been many more since then, and at present the recovery rate is above 15 per cent.

Treatment.—Surgical intervention is indicated as soon as the diagnosis of intestinal atresia is established. The condition is always rapidly fatal if untreated, the usual survival period without operation being about six days, so nothing is lost by operation. Surgical treatment obviously has the best chance of success while the patient is still well hydrated and before alkalosis has developed. Dehydrated infants must first be restored to as nearly normal fluid and electrolyte balance as possible by the intravenous administration of isotonic saline solution, usually about 10 to 15 cc. per pound of body weight, with an additional 50 to 75 cc. of 5 per cent dextrose solution per pound of body weight. The stomach must be thoroughly emptied before operation. This is easily done by using a No. 10 catheter inserted through the nostril and aspirating with a syringe. If jaundice should be present a bleeding tendency may be combated by administration of Vitamin K. It must be remembered that infants are easily overhydrated, and the amount and speed of administration of fluids must be carefully regulated. External heat should be applied during the operation, and the extremities may be wrapped in flannel.

Anesthesia and Operation.—Light drop ether anesthesia is very satisfactory. Atresias of the jejunum and ileum should be treated by a side-to-side anastomosis between the proximal dilated and distal collapsed loops of bowel. Ileostomy or jejunostomy has been uniformly unsuccessful, although Smith[9] reported a case that in which the patient lived for forty-one days after this procedure. In a very desperate case it has been suggested that the proximal dilated bowel might be exteriorized, after which frequent needle aspirations could be carried out to reduce the distention and an anastomosis done as soon as the condition of the patient improves sufficiently to permit it. The tissues must be handled with extreme gentleness, and complete hemostasis is essential. If an intrinsic obstruction of the duodenum is present, a duodenojejunostomy rather than the simpler gastrojejunostomy is the procedure of choice, as Ladd has found that the latter procedure is often followed by duodenal stasis necessitating a second operation. Several little technical details have been described by various authors which at times may prove helpful. Potts[3b] advised injecting saline solution into the distal bowel and then following it down to the rectosigmoid to rule out any other point of obstruction below the original site. Webb and Wangensteen[3a] recommended dilating a section of the distal bowel with air prior to carrying out the anastomosis, in order to make it more nearly conform with the caliber of the proximal bowel. Ladd[10] suggested carrying out the anastomosis with a small catheter inserted into the distal bowel. This dilates the distal segment at the site of the anastomosis and also helps to outline the bowel wall during suture. Since in about 15 per cent of cases of congenital atresia of the intestine the defects are multiple, it is necessary to explore the intestine thoroughly in order to avoid overlooking additional defects. If multiple atresias are present the intestine below the most distally located atresia must be selected for the site of anastomosis. A successfully handled case of this type was recently reported by Duncan.[11] Isolated segments were by-passed, to be taken care of at a later date.

A blood transfusion of 50 to 100 cc.

during the operation may be helpful. The anastomosis is done, with use of four or five No. 0 black silk or catgut on an atraumatic needle. After operation the infant should be placed in an oxygen tent. Penicillin (10,000 to 20,000 units) is given intramuscularly every three hours. The gastric suction is maintained for forty-eight to seventy-two hours, after which small amounts of water may be cautiously started by mouth.

SUMMARY

1. The case is reported of an infant girl aged 20 hours with congenital atresia of the jejunum managed successfully by surgical intervention.

2. Meconium peritonitis was observed at the time of operation, apparently the result of infarction and perforation in the proximal end of the distal bowel segment. This did not complicate the postoperative course to any significant extent.

3. An infant with congenital stenosis or atresia of the bowel in whom the condition is recognized soon after birth now has a fair chance of recovery after adequate surgical treatment, judicious selection of suture material, use of antibiotics, and suitable preoperative and postoperative estimation of physiologic requirements.

ZUSAMMENFASSUNG

1. Es wird ein Fall von angeborenem Verschluss des Jejunums bei einem zwanzig Stunden alten Maedchen berichtet, bei dem eine Operation mit Erfolg ausgefuehrt wurde.

2. Waehrend der Operation fand sich eine Meconiumperitonitis vor, die offenbar das Ergebnis eines Infarkts und Durchbruchs im proximalen Ende des distalen Darmabschmitts war. Der Verlauf nach der Operation wurde durch diese Komplikation in keiner Weise beeinflusst.

3. Ein Saeugling mit angeborener Verengung oder Verschluss des Darmes hat heute, wenn die Erkrankung bald nach der Geburt erkannt wird, eine ziemlich gute Aussicht auf Heilung, wenn, ein angemessener chirurgischer Eingriff unter sorgfaeltiger Auswahl des Nahtmaterials ausgefuehrt wird, wenn Antibiotika angewandt und alle praeoperativen und postoperativen Massnahmen unter sorgfaeltiger Beruecksichtigung der physiologischen Faktoren durchgefuehrt werden.

RÉSUMÉ

1. On rapporte le cas d'une enfant de 20 heures présentant une atrésie congénitale du jéjunum qui fut très bien réparée par une intervention chirurgicale.

2. Même en présence d'une péritonite dûe au méconium, péritonite visible à l'opération, et dûe à l'infarctus èt à la perforation du bout distal de l'intestin; l'évolution post-opératoire a été sans complications.

3. Un enfant qui présente dès sa naissance une atrésie ou une sténose congénitale de l'intestin, voit ses chances de guérison s'accroitre si le diagnostic est fait tôt, si un chois judicieux des ligatures est fait, si on emploie des antibiotiques et surtout si l'on établit bien les exigeances physiologiques pré- et post-opératoires.

RIASSUNTO

1. Riporta un caso di atresia congenita del digiuno in una bambina da 20 ore condotto con successo presso l'intervento chiurgica.

2. Al ora dell'operazione si e' osservato peritonite meconio, evidentemente il risulto d'infarto e perforazione del ansa prossima del segmento lontano del intestino. Questa non complicava nulla il corso postoperatorio.

3. Un fanciullo con stenose congenita od atresia del intestino nel quale la condizione e' riconosciuta tosto appresso nascita' oggigiorno ha un caso favorevole di guarigione secondo trattamento chirurgico sufficiente, scelta giudiziosa di materiale sutura, impiego di antibiotici, e

valutazione particolare preoperativo e postoperativo dell'esigenze fisiologiche

RESUMEN

1 Se comunica el caso de una niña de 20 horas de nacida con atresia yeyunal congénita tratada satisfactoriamente con intervencion quirurgica

2 Se observo al operar peritonitis meconio, aparentemente resultante de infarto y perforacion en el extremo proximal del segmento intestinal distal Esto no produjo ninguna complicacion postoperatoria

3 Un niño recien nacido con estenosis o atresia intestinal congenita, cuyo estado se reconoce desde luego, tiene ahora una buena probabilidad de recuperacion despues de tratamiento quirurgico adecuado, seleccion juiciosa de material de sutura, uso de antibioticos y estimacion pre y postoperatoria apropiada de los requerimientos fisiológicos

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Reestablishing Lymph Drainage for Lymphedema of the Extremities

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POSTOPERATIVE lymphedema is a disconcerting surgical complication. It is disheartening to the patient and embarrassing to the surgeon. Despite this fact, very little appears to have been done about remedying the situation. A survey of the British and American literature reveals only seventeen published articles on the subject. These for the most part have been concerned with speculations and hypotheses regarding the etiopathologic background. The authors, however, who expressed an opinion maintained that no specific treatment has yet been devised. Massage, rest, elevation of the part and use of the elastic bandage, it was agreed, are palliative measures only, whereas operative procedures such as the Kondoleon,[1] Reinhoff,[2] Standard,[3] Ghormley[4] and Pratt[5] methods often lead to disfigurements as grotesque as the malady.

No originality is claimed for this paper as regards the principle of the therapy involved. This has been tested many times. Handley,[6] Ransohoff,[7] Guthrie,[8] and others have shown the effects of subcutaneous implantation of nonabsorbable material in the lymphedematous subject. But these are open surgical procedures. The method in this instance, however, is somewhat different and off the beaten path, and was developed because of a situation in which an open surgical procedure appeared contraindicated. The case was that of a 46-year-old woman who had discrete lymph glands generally distributed but particularly prominent in the inguinal region. A biopsy of one of these glands led to a pathologic diagnosis of Hodgkin's disease, and a course of roentgen therapy was applied to the area. Shortly after this the left leg swelled perceptibly until, when the patient presented herself for treatment, it was seen that the left leg measured 47 inches (119.3 cm.) in circumference at the midthigh level.

Because of the hard, woody and brawny induration around the entire inguinal region, it was deemed inadvisable if not impossible to do any open surgical procedure such as is offered by the Kondoleon or Ghormley and Pratt methods. As a result, it was concluded that could the inguinal crease be bridged by a foreign material (e.g., by a nylon suture as advocated by Handley and Ransohoff) perhaps the lymph drainage would be reestablished. With this thought in mind a long needle was inserted subcutaneously, starting above the inguinal crease and extending below the entire remaining needle length, perforating the skin at the lower pole. A nylon suture was then threaded back through the bore of the needle, and on withdrawal of the needle the nylon suture remained subcutaneously submerged. The largest needle available was 7 inches (17.7 cm.) in length and of a No. 20 gauge. This needle was inserted in the extreme lateral margin of the upper aspect of the left thigh, outside the brawny area. A second suture was directed in a similar manner but approximately 2 inches (5 cm.) more laterally. Within a few days the patient noticed the size of the leg diminishing. Four weeks later, on reexamination, the leg was seen to have been reduced to 31 inches (78.7 cm.) in circumference. There developed subcutaneously above the inguinal fold and over the lower abdomen a hard mass approximately 12 inches (30.4 cm.) in diameter. It presented the picture one observes on administration of a hypodermoclysis. This caused some concern for a while, as the patient showed

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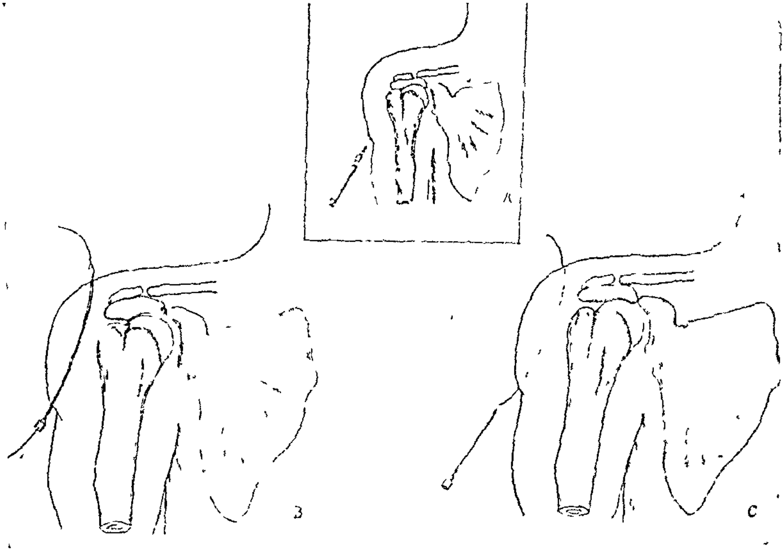

Schematic drawings of steps in technic.

signs of pulmonary complications. With bed rest and antibiotics, however, the condition cleared satisfactorily, and the leg continued to diminish until it reached the size of the well leg.

A second type of patient in whom the effectiveness of the procedure is exemplified is the unfortunate in whom lymphedema of the arm develops after radical mastectomy. These comprise some 15 or 20 per cent of persons submitting to this form of surgical treatment. Representative of this group is a patient who had an extensive dissection with removal of all visible axillary glands after a diagnosis of carcinoma of the left breast. An extensive course of roentgen therapy was administered. Swelling quickly developed, the arm at the elbow reaching 18 inches (76.2 cm.) in circumference. The woman was totally incapacitated. She was required to remain in bed for the greater part of the day, with elevation and suspension of her entire arm. The arm, moreover, was so heavy that it required constant support, making it difficult for the patient to be up and about more than an hour at one time. The condition was present for three years. Two sutures were placed, one on the anterior aspect of the arm beginning at the midbiceps area and extending to the level of the middle clavicular region; the other on the posterior surface, beginning at the middle triceps area and extending to the middle scapular position. Within a week's time the edema had receded to the following extent:

Inches from wrist	2	*6*	9	*14*
Date				
9/14/50	8	11	13	13¾
9/23/50	7	10¼	11	12
10/19/50	5¾	7½	9¾	9¾

A third type of application of this form of therapy was made because of a complication following circumcision on a boy aged 17. An edematous watery sac measuring approximately 5 by 5 centimeters developed about the intact frenulum. The boy was epileptic, and it was feared that such a condition, if allowed to remain, might provoke considerable instability and a recurrence of his seizures. A single nylon suture was inserted by the same method, beginning at the midportion of the edematous area and perforating the skin over the symphysis pubis. The suture material was anchored to the abdominal wall with adhesive strips. On the following morning the dressing was quite moist and the swelling had dramatically disappeared. Two days later the boy returned the suture, stating that it was no longer needed, as it had come out during the night.

A further test of the value of the procedure was given in the case of possible filariasis. The patient, a 30-year-old man, while working in a ship's drydock, developed an elephantoid scrotum after an insect bite. Plastic operations corrected the abnormal size of the scrotum, but removal of the inguinal glands several years later resulted in a grotesque configuration of the penis. Today this man is restricted to sedentary work and is a taxicab driver. He has suffered his embarrassment for twelve years. Observing the results obtained from inserting a thread through the skin of the penis of the 17-year-old boy who had postoperative edema following circumcision, I advised this unfortunate man to have a trial of the method, to which he readily consented. The needle was directed subcutaneously through each lateral surface of the swollen penis and a No. 1 nylon suture threaded according to the procedure outlined. In four days the circumference of the penis was reduced from 7 to 5 inches (17.7 to 12.7 cm.) and the overall length, appearance and shape definitely improved.

The 7-inch needle, however, could not reach the pubis, and as a result fluid accumulated at the base of the penis, creating an obvious complication. Two other sutures subsequently planted from the midpenile area and extending above the symphysis pubis resulted in satisfactory reduction of the edema. Six weeks later the glans penis was observed for the first time in twelve years.

Technic.—To recapitulate, it is possible to help patients crippled with lymphedema without subjecting them to extensive radical operations. In the present instance a large needle 7 to 12 inches (17.7 to 30.4 cm.) in length and preferably No. 19 or No. 20 gauge may be used, which, after being inserted subcutaneously and forced out through the skin at the lower pole, is threaded with a No. 1 nylon suture. A small wheal is first made in the selected area of the skin and 1 per cent procaine solution (see illustration) is injected. For this purpose a small hypodermic needle and syringe are employed. The large needle is now attached to a 5 or 10 cc. syringe containing 1 per cent procaine. The needle is pushed through the wheal and directed subcutaneously, injecting the procaine ahead of it. When the full length of the needle is reached the point is forced through the skin and the nylon suture is threaded back through the needle bore until several inches are obtained at the hub end. The suture is grasped firmly at the needle point, and the needle is quickly withdrawn by a sweeping upturn movement. The maneuver leaves the nylon buried subcutaneously. The nylon is now cut flush with the skin and withdrawn until the end lies ¼ inch (0.6 cm.) under the skin. The other end of the suture is similarly cut flush with the skin and pushed under as far as possible. A "band-aid" covers each cutaneous perforation after a spot of antiseptic is applied. The extremity is elevated and wrapped with an elastic bandage.

COMMENT

The mechanism involved in establishing lymph drainage by the subcutaneous implantation of nonabsorbable material (e.g., as nylon) may be disputed. Doubtless capillary attraction has a major part in it. The rapid decrease in the size of the organs attests to the tremendous mobilization of fluids despite the small caliber of the thread and the resultant bore of the channel it creates Some maintain that new lymph channels are created and continue the process indefinitely That fluid in great quantities can be mobilized by capillary attraction is well exemplified in nature, as is seen in the rise of sap in the great sequoia trees The absorption of the fluid thus mobilized, however, probably is similar to that of any parenteral fluid given subcutaneously

The variety of the structures upon which the method has been employed and the experience herein obtained should permit one to conclude that the procedure has usefulness Certainly the simplicity and safety of the method should recommend and invite a more extensive trial

SUMMARY

The author presents a method of reestablishing lymph drainage to relieve lymphedema of the extremities without subjecting the patient to radical surgical *procedures* He has obtained results which, together with the simplicity and safety of the method, in his opinion justify its more extensive use

RESUMEN

Se presenta un metodo para restablecer la canalizacion linfatica, con objeto de aliviar el linfoedema de las extremidades sin recurrir a procedimientos quirurgicos radicales En virtud de los resultados obtenidos y la simplicidad y seguridad del metodo, el autor opina que hay justificacion para el uso mas extenso de esta tecnica

RESUME

L'auteur presente une methode pour retablir le drainage lymphatique dans des cas d'oedeme des extremites dû a un bloquage des lymphatiques, sans soumettre son patient a des manoeuvres chirurgicales L'auteur a obtenu des resultats qui, *a son avis, presentent une simplicite et* une securite techniques justifiant davantage l'emploi de sa methode

ZUSAMMENFASSUNG

Der Verfasser berichtet ueber eine Methode der Wiederherstellung des Lymphabflusses von den Extremitaeten zur Behandlung des Lymphoedems, die dem Kranken einen radikalen chirurgischen Eingriff erspart Die Erfolge, die Einfachheit und die Sicherheit der Methode rechtfertigen nach der Meinung des Verfassers eine umfangreichere Anwendung dieser Technik

RIASSUNTO

L'A presenta un metodo di ristabilire scorrimento di linfa a sollevare linfedema dell'estremita' senza sommettere il paziente ad interventi chirurgici radicali Ha ottenuto risultati i quali nella sua opinione, insieme colla semplicita' e sicurta' del metodo giustificano piu vasto avvantaggio di questo tecnico

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Congenital Anomalies of the Testicle

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ABNORMALITIES of the external genitalia of the male are sufficiently common to permit some conclusions regarding their treatment.

All congenital anomalies of the male genitalia should be corrected before puberty for two reasons: 1. A boy pays little attention to his sexual parts until he reaches puberty; then he becomes greatly exercised psychically if he is different from his companions. He should, therefore, be rendered normal in order to avoid this psychological hazard. 2. If the young male's organs are not normally placed, though normal anatomically and functionally, the proper development of the organs cannot take place, which greatly impairs them both anatomically and physiologically.

This applies particularly to the testicles, and any anomaly of these important structures should be corrected as soon after the child has reached the age of 4 years as possible, and under all circumstances before puberty.

Medical literature contains many reports of congenital variations in the number of the testicles, the authenticity of which must be seriously questioned. The accurate diagnosis of such anomalies is dependent upon very careful examination at autopsy or surgical exploration, and mistakes in diagnosis are easily made. There are rare instances of absence of one or both gonads; but usually proper examination in suspected cases will reveal an ectopic testicle. So, too, in most cases of suspected supernumerary testicle the condition turns out to be encysted hydrocele or some other relatively common scrotal lesion. In rare instances, however, an actual supernumerary testicle does occur.

As we have recently encountered several of these rarities, it was felt that a review of the subject, and of the literature on testicular anomalies, was in order.

ANOMALIES IN NUMBER OF TESTICLES

Anorchidism and Monorchidism.—Congenital absence of both testicles is one of the rarest of anomalies, only 13 authentic cases having been reported up to 1949 (Hepburn). In 6 of these the condition was diagnosed at autopsy and in 7 at operation. One subject was a full-term fetus and one an infant 8 weeks old; the remainder were between 11 and 61 years of age.

Congenital absence of one testicle, though more common, is also very rare. Kawaichi, Cooper and O'Donnell found 49 cases up to 1949, and none has been reported since.

A correct diagnosis of these anomalies is dependent upon careful autopsy or surgical exploration, as absence of the testicle may readily be confused with abdominal retention or ectopia. Such anomalies are believed to be due to total or partial failure of embryonic development of the gonads or, much less probably, to intrauterine atrophy of the testicle resulting from disease or trauma. The fact that absence of the testicle may be associated with other anomalies, such as absence of the kidney and ureter, exstrophy of the bladder, malformations of the rest of the seminal tract, imperforate anus, and rectovesical and rectourethral fistulas, strengthens the belief that this is a developmental defect.

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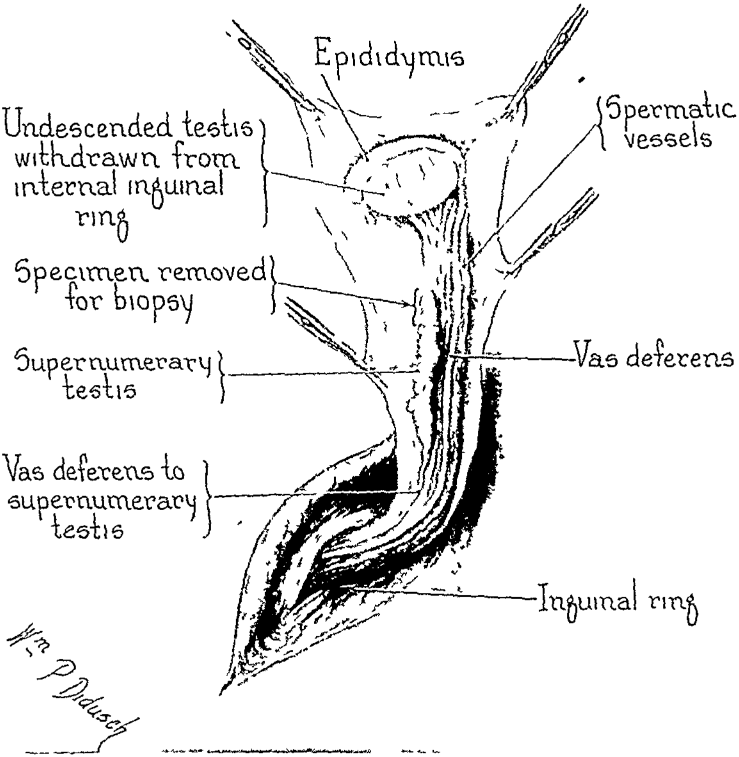
Epididymis
Undescended testis withdrawn from internal inguinal ring
Spermatic vessels
Specimen removed for biopsy
Supernumerary testis
Vas deferens
Vas deferens to supernumerary testis
Inguinal ring
Wm P Didusch

Fig 2—*Authors' case of transverse ectopic testicon* right side (normal testicle on left) Note undescended right testicle, with normal epididymis and vas, withdrawn from internal inguinal ring In the cord, about 7 cm from the normal testicle, is a small mass of tissue resembling an unwound epididymis, from which extends a small vas This was removed and orchiopexy done Microscopic examination showed it to be testicular tissue, without spermatogenesis

Anorchidism produces, of course, a natural eunuch, impotent and with a feminine aspect In monorchidism, on the other hand, there may be normal development of the external genitals and secondary sex characteristics, with potency and the ability to reproduce, provided the other testicle is normal Frequently this one testicle undergoes compensatory hypertrophy

Polyorchidism—The presence of a supernumerary testicle is frequently diagnosed but rarely occurs Many of the extra testicles reported in the literature were diagnosed on palpation only, or were observed at operation or autopsy but not subjected to microscopic examination. In a thorough review of the literature we have found only 18 authenticated cases, the one presented here making the nineteenth. In these, the extra testicle was on the right side in 7 cases and on the left in 12. Only those cases should be accepted as authentic in which the diagnosis has been proved by histologic examination, as there are a number of more common conditions which, clinically, may be mistaken for polyorchidism. These include encysted hydrocele, omental hernia, small tumors or cysts, and spermatocele.

The first reference to this subject appears to be that of Blasius, who, in 1670, observed three testicles during a routine autopsy. Lane, in 1895, was the first to record an example of polyorchidism proved by operation and histologic examination. In 1923 Jeannin and Delater reported the first case to show normally functioning testicular tissue in the extra organ. In 1942 Cranz removed a degenerate intra-abdominal testicle at the time of appendectomy in a patient with two clinically normal gonads in the scrotum.

Table 1 lists the 18 authentic cases found in the literature. In only 3 of these was active spermatogenesis noted.

Supernumerary testicles may differ considerably in type. Usually the two testicles have a single vas and an epididymis elongated to serve them both; but there may be duplication of the entire tract (testicle, epididymis and vas), as in Thiessen's case; or the extra testicle may have neither an epididymis nor a vas, or it may have an epididymis and vas opening into the epididymis of the other testicle. Usually the extra gonad is smaller and lacking spermatogenesis.

In most of the recorded cases the condition was discovered at operation for hydrocele, hernia, suspected tumor or other scrotal pathologic lesion. The supposedly third testicle must be differentiated from two testicles on one side with the opposite side of the scrotum empty (transverse ectopia).

The following case of polyorchidism was recently observed by us:

W. B., 11 years old, was admitted to St. Clare's Hospital on Aug. 1, 1949, with a diagnosis of undescended testicle. For two years he had been receiving hormonal therapy to no avail, and operation was advised.

Physical examination showed no abnormalities except absence of the right testicle from the scrotum and tenderness to deep palpation in the right inguinal region over the internal ring. The left testicle was normal in size, shape, consistency and position. All laboratory data were within normal limits.

On the second hospital day, orchiopexy was performed by the senior author. The right testicle was found to be situated in the right inguinal canal, in the region of the internal ring. It was normal in appearance, although slightly smaller than the left. In the spermatic cord, about 6 or 7 cm. from the right testicle, was a small, irregular mass of undifferentiated tissue, approximately 0.5 by 1.5 cm., from which extended a cordlike structure resembling a vas (Fig. 1). This was removed, and a biopsy specimen was taken for microscopic examination. The normal right testicle was reduced into the scrotum and fixed with a No. 2 chromic catgut suture to the skin of the thigh.

The patient had an uneventful convalescence and was discharged fifteen days later, with the wound healed and the right testicle in the bottom of the scrotum.

The pathologic report read: "Gross: Specimen consists of one minute bit of white tissue, given in toto for sectioning. Microscopic: Section shows a small island composed of atrophic tubules with a goodly amount of connective tissue in the stroma. There is no evidence of spermatogenesis. Diagnosis: Small bit of testicular tissue."

ANOMALIES IN POSITION OF TESTICLES

Cryptorchidism. — In cryptorchidism the testicle, instead of descending to its normal position in the bottom of the scrotum, is arrested at some point in the line of normal descent. In its migration from its embryonic location in close proximity to the primitive kidney, the testicle must descend along the posterior abdominal parietes, through the inguinal canal and the upper part of the scrotum. Thus there may be retention of the gland within the abdominal cavity, or in the inguinal canal between the internal and external rings (the most common location), or in the upper part of the scrotum. In an interesting case reported by the senior author and Dr. H. C. Curtis in 1940, the right testicle was found in its embryonic position at the level of the kidney hilum, having never descended at all, and the left testicle was found in the iliac fossa, outside the iliac vessels.

Retention of the testicle in its anomalous position is due to faulty development of the structural route along which it must descend. The exact mechanism is obscure. Suggested contributory factors include: maldevelopment of the scrotum and its investing pouches, or of the gubernaculum, cremaster muscle, or inguinal fold; loosening and subsequent closing of the rings of the inguinal canal; the actual and relative growth of the body with that of the testicle; external and increased intra-abdominal pressure; and hormonal deficiencies.

Failure of the testicle to descend causes that side of the scrotum to appear shriveled and, frequently, to remain noticeably underdeveloped. In bilateral nondescent, the appearance of the scrotum simulates that of the labia majora of the female.

Undescended testicles in adults are atrophic, and spermatogenesis is absent. These degenerative changes become increasingly recognizable after puberty; hence the importance of treatment before that time. *Hernia* is a very common accompaniment of imperfectly descended testicles, and widely-gathered statistics indicate that such gonads are more liable to *trauma* and to *malignancy* than is the fully descended testicle. Malignant change is especially common in the abdominally retained gland.

Intra-abdominal testicles are also more liable to *torsion*. Having lately observed a case of torsion of an abdominally retained left testicle which also contained a malignant tumor,* we reviewed the literature and found 12 other reports of torsion of abdominal testicles (Table 2). Eight were on the right side and 4 on the left. Since abdominal retention appears to be nearly as common on both sides, Ormond has suggested that the presence of the cecum, with its intermittent loading and pull on the peritoneum, must have something to do with the greater predominance of torsion on the right side. Most interesting is the fact that in 6 of the 12 reported cases, and in the case observed by us, the affected testicle contained a malignant tumor. All 13 patients were between the ages of 15 and 42. The condition is marked by a sudden onset, sometimes but not always preceded by previous attacks, and by extremely severe pain, tenderness and muscular resistance. Pain may be the only symptom, but sometimes there are fever, chills, nausea and vomiting. There is absence of the testicle from the scrotum; nevertheless, the condition is not readily diagnosed. In only 4 of the reported cases was the diagnosis definitely made preoperatively. In 4 the condition was diagnosed as appendicitis; in 1 as acute disease of the abdomen; in 3 as appendicitis or a lesion of an intra-abdominal testicle; and in the case seen by us as torsion of the testicle or appendicitis.

Ectopia of the Testicle.—In ectopia, a much rarer anomaly, the testicle, instead of being retained at some point along its normal course of descent, is actually displaced to an anomalous position. There are several types of ectopia:

In *inguinal ectopia* the testicle, after passing through the external ring, is deflected upward and outward and comes to rest upon the superficial surface of the aponeurosis of the external oblique muscle.

In *pubopenile ectopia* it is found at the base of the penis, overlying the pubic bone. Only 5 such cases were reported up to 1945 (Kaufman).

In *femoral or crural ectopia* it is found in Scarpa's triangle, on the medial side of the thigh.

In *perineal ectopia*, after passing

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*To be reported by Dr Robert W Hunt, Director of the Department of Urology of St Clare's Hospital.

through the external ring, the testicle migrates into the perineum. Cecil reported 104 cases of this type up to 1947.

Very rarely a testicle will descend into the true pelvis (*pelvic ectopia*). Our associate, Dr. Robert W. Hunt, in 1940 reported a most unusual case of bilateral pelvic ectopia in which both testicles were successfully brought into the scrotum by operation.

In *transverse ectopia* the testicle descends by the same inguinal canal as its fellow and occupies the same side of the scrotum. The two vasa lie close together, and may remain entirely separate or may wholly or partly fuse. According to Kimura, when both vasa pass through one side of the body absolutely, the anomaly may be recognized as a faulty development of both testicles on one side; but if one vas, after passing through the same inguinal ring with the other, crosses the median line and descends to the seminal vesicle on the other side, while the other vas takes a normal course, it shows that the testicle has been displaced to the opposite side during its descent. The exact mechanism by which displacement occurs is unknown. The function of the gubernaculum testis is apparently to guide and to some extent draw the testicle from the abdomen into the scrotum; and it has been suggested that certain fibers of the gubernaculum may exert unusual tension upon the testicle in such a way as to divert it from its normal line of descent, and the advance of a hernia may push it into an anomalous position. This anomaly is frequently associated with congenital inguinal hernia and, less often, with hypospadias and the presence of a small, infantile uterus within the scrotal sac. The palpable ectopic testicle is easily diagnosed; but if the gland is intra-abdominal and cannot be palpated, the diagnosis can be made only by exploratory operation.

A review of the literature reveals reports of only 24 cases of transverse ectopia (Table 3), to which we now add an additional case. This case is especially interesting as it is the only instance we have found of a *transverse ectopic testicle containing a malignant tumor.*

B. M., 30 years old, was admitted to St. Clare's Hospital on March 2, 1950, for a right herniorrhaphy and plastic repair of the urethra. Nine years previously he had had repair of a perineal hypospadias and a left herniorrhaphy, at which time no testicle could be found on the left side. The patient was happily married but had no children.

Physical examination disclosed well healed scars of a left inguinal herniorrhaphy and a suprapubic cystostomy. There was a small, indirect, reducible right hernia. No masses could be felt in the inguinal canal. At the end of the penis was a normal-appearing meatus, and in the penoscrotal junction an opening through which the patient urinated. There was also a minute fistulous opening in the perineum, which leaked a few drops of urine during micturition. The right testicle, epididymis and vas were normal to palpation; the left testicle was absent. All laboratory data were within normal limits.

With spinal anesthesia, plastic repair of the urethroperineal and urethropenoscrotal fistulas was done by the senior author. A right herniorrhaphy was then performed. During dissection and freeing of the vas from the hernial sac, there was found—in the middle third of the inguinal portion of the vas and hanging from it by a small cord—a mass with all the macroscopic characteristics of a testicle except an epididymis. This mass was about 1.5 cm. long and 8 mm. in width and depth (Fig. 2). It was resected and sent to the laboratory for microscopic examination.

The patient was discharged nineteen days later, voiding through the penis and with both fistulous openings well healed.

Pathologic Report (Dr. Jacob M. Ravid). —"Nature of specimen: testicle.

"Gross: Specimen is a small elliptoid nodule about the size of a green olive, measuring 22 x 12 x 8 mm. and weighing 3 grams. The external surface is smooth, glistening, and intact. On section, it is of a uniform pale greyish-white color, semi-elastic and firm in consistency. Near the periphery of the nodule, a rim of soft creamy-white tissue is seen, which has the appearance of a remnant of testicular substance and from which tubules can be teased out with ease.

"Microscopic: Sections from the solid tumor nodule show it to be made out of innumerable

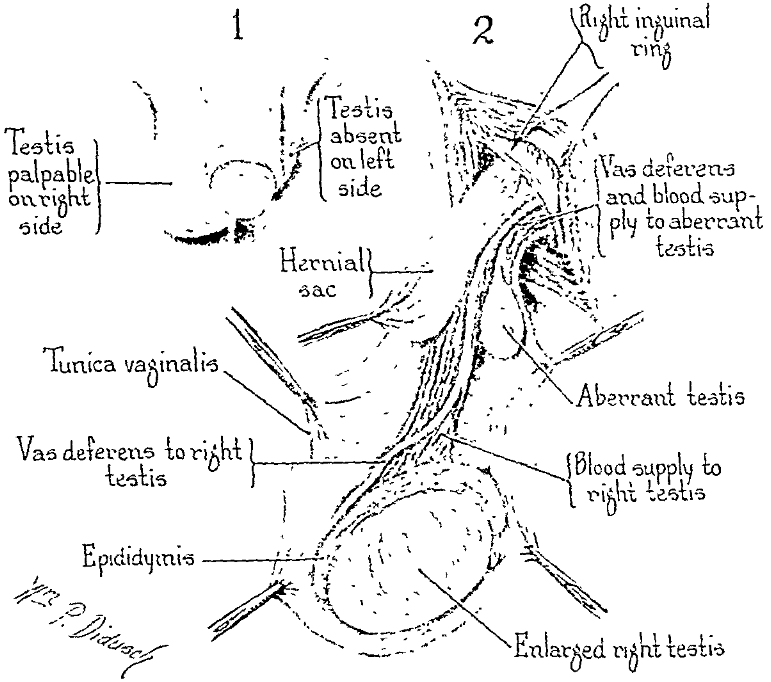
1
2
Testis palpable on right side
Testis absent on left side
Right inguinal ring
Vas deferens and blood supply to aberrant testis
Hernial sac
Tunica vaginalis
Aberrant testis
Vas deferens to right testis
Blood supply to right testis
Epididymis
Enlarged right testis
Wm. P. Didusch

Fig. 2.—Authors' case of transverse ectopic testicle containing malignant tumor. At 1, note absence of testicle on left side of scrotum; at 2, enlarged right testicle, with epididymis and vas; small, aberrant testicle, without epididymis but with vessels and a vas which joined the normal vas higher up, in its inguinal portion. This ectopic testicle was removed, and on section was found to contain a malignant tumor.

large, irregular, compact masses of cells. The component cells are polygonal or irregular in shape and have a large, rounded or fuzzy, hyperchromatic nucleus, and a moderate amount of cytoplasm. One to three nucleoli are seen in most of the nuclei. An occasional mitosis is found. These large cells are loosely arranged in irregular nests and sheets. These nests of large cells are surrounded by a dense connective tissue layer rich in lymphocytic elements which frequently assume a follicular pattern. Areas of calcification are also noted. Histiocytes and epithelioid cells are diffusely scattered through the connective tissue matrix.

"Sections taken from the outer rim of the specimen show a goodly number of atrophic tubules, most of which are compressed and hyalinized. Those that are better preserved show no evidence of spermatogenesis.

"Diagnosis: Seminoma or disgerminoma of ectopic testicle."

Treatment of Cryptorchidism and Ectopia.—Ectopia of the testicle always re-

TABLE 1.—*Eighteen Cases of Polyorchidism Proved by Histologic Examination*

Year of Report	*Author*
1895	Lane
1899	Lossen
1907	Mariotti
1910	Lerat
1922	Haas
1923	Jeannin and Delater
1924	Lecène
1925	Holder
1928	Edington and Blacklock
1931	King
1933	Boggon
1936	Chevassu
1939	Goldstein and Casilli
1942	Cranz
1943	Thiessen
1944	Handley and Crawford
1947	Dardill and Constantine
1950	Smith, Evans and Suder

TABLE 2.—*Twelve Cases of Torsion of Intra-Abdominal Testicle*

Year of Report	*Author*	*Tumor*
1898	Gerster	Yes
1905	Stiles	Yes
1907	LeConte	Yes
1907	Howard	
1915	Cupler	
1927	Ormond	
1927	Pearlman	Yes
1929	Wallenstein	
1933	Power	
1933	Chitty	Yes
1935	Beller	
1943	Whittington	Yes

quires surgical correction (orchiopexy).

Nondescent or partial descent of the testicles at birth is quite common. If they have not fully descended by the end of the first year, it is customary to consider the condition abnormal. Some of these testicles will descend spontaneously later —usually at or shortly after puberty. It is our belief that hormonal therapy may hasten the descent of some testicles, but that these are the type of undescended glands which would descend spontaneously at puberty. True undescended testicles, whose passage through the inguinal canal is prevented by mechanical obstacles, require surgical intervention. With the arrival of puberty, undescended testicles undergo regressive changes which lead to destruction of the seminal epithelium; hence correction before puberty is of great importance, to permit the organ to develop normally. When hormonal therapy has been utilized and fails to effect descent within a reasonable period, orchiopexy should be done without delay.

For operation to be successful, it must (*1*) preserve the blood and nerve supply of the testicle; (*2*) fix the testicle in the bottom of the scrotum without undue traction upon the cord, and (*3*) cure the hernia that almost always accompanies the cryptorchidism. Usually the cord is found to be of good length if the vessels are freed. The success of operation is pro-

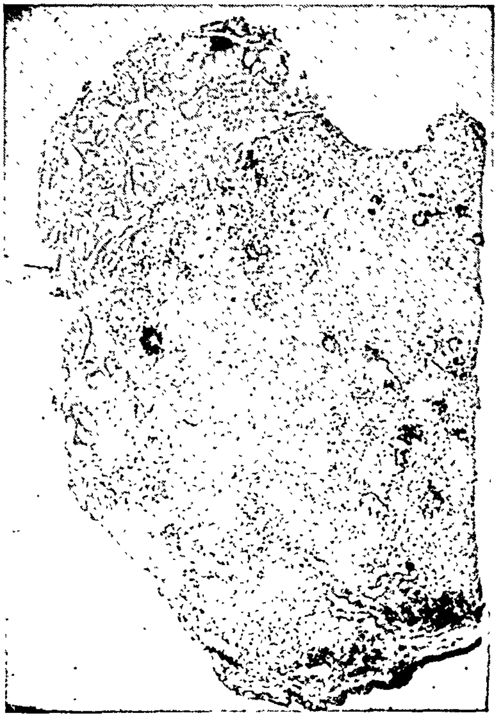

Fig. 3.—Transverse ectopic testicle. Low-power photomicrograph showing almost entire tumor, with a remnant of atrophic testicular tubules at periphery. The darker-staining islands scattered through the tumor are clumps of histiocytes.

TABLE 3.—*Twenty-Four Cases of Transverse Ectopic Testicle*

Year of Report	*Author*
1886	Lenhossék
1895	Jordan
1901	Linser
1903	Christopherson
1904	Berg
1905	Halstead
1905	Romanovsky and Winiwarter
1907	Cornil and Brossard
1909	Castelli
1910	Duse
1910	Bottaro
1911	Marsh
1912	Iwasaki
1916	Hertzler
1918	Pagliere and Pozzi
1918	Kimura
1927	Bustos
1928	Siciliani
1928	Howald
1930	Link
1934	Hawlisch
1938	Alberti
1938	Alberti
1942	Loscertales

portional to the completeness with which the fibrous tissue surrounding the vas and vessels of the cord is removed.

In our method of performing orchiopexy, the testicle, after being brought into the scrotum, is fixed in the skin of the thigh, from which it is detached at a later date. This is accomplished by fixing a No. 2 chromic catgut suture, doubled, to a nonfunctioning part of the investments of the testicle. The long needle is then pushed through the most dependent part of the scrotum and fixed well down on the thigh, thus serving to hold the testicle in position until it becomes attached to the scrotum and will not be drawn back into the inguinal canal by sudden movement, such as coughing or other activity. It has been found that a three weeks' chromic catgut suture No. 2 will hold for eight days.

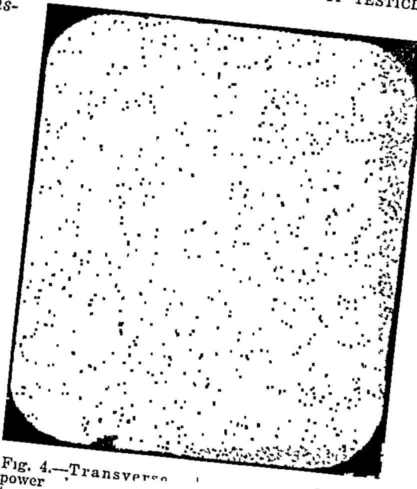

Fig. 4.—Transverse
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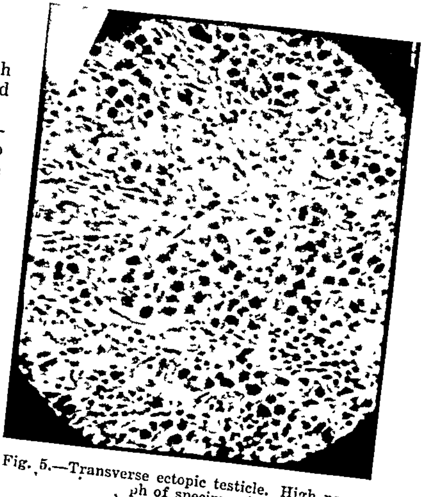

Fig. 5.—Transverse ectopic testicle. High power
ph of specimen in Figure 4.

SUMMARY AND CONCLUSIONS

The authors have carefully reviewed the literature and listed 18 cases of polyorchidism proved by histologic examination, adding one of their own.

Twelve cases of torsion of an intra-abdominal testicle have been collected and a new one added by permission of Dr. Robert W. Hunt, who will report his case shortly. In 7 of the cases the testicles contained malignant tumors, including the one described here.

Twenty-four cases of transverse ectopic testicle have been reported. These are listed, and a personal case is described in which there was also a malignant tumor. The authors have found no other report of malignancy in a transverse ectopic testicle.

The treatment of cryptorchidism and ectopia is reduction of the testicle into its proper position in the scrotum, where it is retained by a No. 2 chromic catgut ligature fixed to the skin of the thigh, from which it is detached at a later date. The vas deferens is always long enough, the nondescent being caused by fibrotic tissue around the blood vessels. This must be completely removed, with preservation of as many as possible of the blood vessels and nerves to insure proper nutriment of the testicle.

RÉSUMÉ ET CONCLUSIONS

Les auteurs ont passé en revue la littérature et noté 18 cas de polyorchidie contrôlée par l'examen histologique; à cette liste, ils apportent un cas personnel.

Douze cas de torsion d'un testicule intra-abdominal furent rapportés avec l'addition d'un nouveau cas, gracieuseté du Dr. Robert W. Hunt, qui en fera bientôt rapport. Sept testicules présentaient des tumeurs malignes, y compris le cas rapporté ici.

Vingt-quatre cas d'ectopie testiculaire croisée furent rapportés. On y a ajouté un cas personnel où il y avait aussi une tumeur maligne. Les auteurs n'ont pas trouvé d'autres cas de malignité rapportée chez les cas d'ectopie croisée.

Le traitement de l'ectopie testiculaire et de la cryptorchidie consiste à placer le testicule dans sa loge normale, située dans le scrotum. On l'attache avec du catgut chromicisé no. 2 à la peau de la cuisse, d'où il est sectionné plus tard. Le canal déférent est toujours assez long. Ce sont des fibres autour des vaisseaux qui empêchent la descente. Ces bandes doivent être enlevées en ayant toujours soin cependant de conserver l'inervation et la vascularisation du testicule.

RESUMEN Y CONCLUSIONES

Se revisa cuidadosamente la literatura y se catalogan 18 casos de poliorquidismo comprobado por examen histológico, agregando 1 caso del autor.

Se han reunido 12 casos de torsión de un testículo intrabdominal y agregado 1 nuevo con permiso del Dr. Robert W. Hunt, quien lo dará a conocer en breve. En 7 de los casos los testículos contenían tumores malignos, incluyendo el caso que se describe.

Se han dado a conocer 24 casos de testículo ectópico transverso. Estos se han catalogado y se describe 1 caso personal en que hubo también un tumor maligno. El autor no ha encontrado otra comunicación de malignidad en un testículo ectópico transverso.

El tratamiento del criptorquidismo y ectopia es la reducción del testículo a su posición adecuada en el escroto, manteniéndolo con una ligadura con catgut crómico núm. 2 fijada a la piel del muslo, de la que se desprende posteriormente. El conducto deferente es siempre lo suficientemente largo, debiéndose la falta de descenso al tejido fibroso perivascular. Este debe extirparse completamente, preservándose debidamente los vasos sanguíneos y nervios para asegurar la nutrición adecuada del testículo.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Die Verfasser geben einen sorgfaeltigen Ueberblick ueber die Literatur ueber 18 Faelle von histologisch bestaetigtem Poly-

orchidismus und fuegen einen eigenen Fall hinzu

Sie haben zwoelf Faelle von Drehung eines intraabdominalen Hodens gesammelt und mit Erlaubnis von Herrn Dr Robert W Hunt einen weiteren Fall hinzugefuegt, *dessen Veroeffentlichung bevorsteht* Von diesen Faellen zeigten sieben, darunter auch der hier beschriebene, eine boesartige Hodengeschwulst

Es liegen 24 Faelle von queren ektopischen Hoden vor Diese werden aufgezaehlt, und ein eigener Fall, in welchem sich ebenfalls eine boesartige Geschwulst befand, wird beschrieben Die Verfasser konnten keinen anderen Bericht ueber eine boesartige Geschwulst in einem queren ektopischen Hoden finden

Die Behandlung des Krytorchidismus und der Hodenektopie besteht in der Reduktion des Hodens in seine normale Lage im Hodensack, wo er durch eine Chrom—Catgutnaht (No 2), die an der Haut des Oberschenkels befestigt ist, gehalten wird Spaeter wird die Naht vom Oberschenkel losgeloest Der Samenstrang ist immer genuegend lang, und der Abstieg des Hodens wird durch fibroeses Gewebe um die Blutgefaesse herum verhindert Dieses muss vollstaendig entfernt werden Dabei sollen moeglichst viele Blutgefaesse und Nerven erhalten werden, um eine ausreichende Ernaehrung des Hodens zu sichern

RIASSUNTO E CONCLUSIONI

L'AA hanno fatto la rivista della letteratura con cura e registrano 18 casi di *poliorchidismo verificati da esame istologico*, aggingendo uno di loro

Dodici casi di torsione d'un testicolo intra-addominale furono raccolti ed uno nuovo agguinto per permissione di Dr Robert Hunt, chi rapportera' il suo caso fra poco In 7 casi i testicoli contenevano tumori maligni, incluso l'uno descritto qui

Ventiquattro casi di testicolo ectopico traverso sono stati rapportati Questi sono registrati, ed un caso personale e' descritto nel quale vi era anche un tumore maligno L'AA hanno travato nessuno resconto di malignita' nel testicolo ectopico traverso

Il trattamento di criptoorchismo ed ectopia e' riduzione del testicolo nella propria posizione nel scroto dove si ritiene *con legatura di corda cromata No 2 fissata* alla pelle della coscia, dalla quale e' distaccata a data piu tardo Il vas deferens e' sempre lungo abbastanza, la nondiscesa essendo causato di tessuto fibrotico intorno i vasi a sangue Questo deve essere completemente sloggiato, con conservazione piu possibile dei vasi e nervi pei assicurare nutrizione sufficiente al testicolo

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Agnogenic Myeloid Metaplasia of the Spleen

Follow-Up After Splenectomy

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IN 1940, Jackson, Parker and Lemon[1] designated a form of myeloid metaplasia of the spleen as agnogenic, on the basis of the fact that the group of patients concerned showed slowly progressive enlargement of the spleen over a long period and presented a blood picture which simulated in some instances myelogenous leukemia; occasionally the picture was that of hemolytic jaundice. As a rule in these cases the peripheral blood reveals the presence of immature red cells and white blood cells.

Differential diagnosis between myeloid metaplasia of the spleen and splenomegaly due to myelogenous leukemia may be extremely difficult. Of the 10 patients reported on by Jackson, Parker and Lemon, 3 received irradiation over the spleen and all died within two years; 3 others were treated by splenectomy and all died within one year; the remaining 4 were followed for periods varying from twenty-two months to many years, except 1 whose case was lost from the records. As a result of this experience, the authors concluded that either irradiation or splenectomy is useless or actually harmful, and that only symptomatic and supportive treatment should be undertaken. A similar conclusion was arrived at by Reich and Rumsey,[2] based on their experience with 5 cases. Four of their patients were subjected to splenectomy, and the end results were as follows: 1 died five years later, at the age of 57; a second continued to have symptoms and evidence of anemia and was alive two and one-half years after splenectomy; a third was alive about four years later, but showed a white cell count of 41,000 per cubic millimeter of blood and had been treated extensively, on a hypothetical diagnosis of Hodgkin's disease, both by irradiation and by supportive measures. The fourth case was followed for a year after splenectomy; the patient was in fairly good general condition, with a leukocyte count of 134,000 per cubic millimeter and a considerable number of nucleated red blood cells in the smear. The fifth patient died five months after the onset of his illness, after the administration of blood transfusions and other supportive therapy, but without operation or irradiation.

Levinson and Limarzi[3] reported the case of a patient with myeloid metaplasia of the spleen, subjected to splenectomy and dying about three weeks thereafter. They were impressed, both by their experience and by the reports of the authors cited, with the unfavorable effect of splenectomy and roentgen irradiation of the spleen in cases of this type.

In the case here reported we encountered an instance of agnogenic myeloid metaplasia of the spleen without having made the diagnosis preoperatively. Splenectomy was performed because of the great size of the organ and the failure of repeated transfusions to bring the red blood cell count out of a very low range. When the diagnosis of myeloid metaplasia of the spleen was made pathologically, the prognosis was regarded as very poor in view of the cited instances of death from this condition after splenectomy. Our experience in this case, however, has been unexpectedly favorable, and more than five years after splenectomy our patient is in good general condition and presents a normal hemogram.

REPORT OF CASE

M.R., a marine engineer aged 38, was admitted to the United States Marine Hospital,

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Baltimore, on Dec. 30, 1943. His chief complaint was of weakness and pounding in the chest. There had been one episode of unconsciousness, causing the patient to fall while walking.

History.—This man had been operated on at the Baltimore Marine Hospital for abdominal pain, hematemesis and melena in September 1942. He had lost about 30 pounds (13.6 Kg.). At operation a zone of induration was observed in the jejunum, about 18 inches (45.72 cm.) below the ligament of Treitz, with omentum wrapped about it. This area was resected, and pathologic examination revealed it to be a zone of nonspecific regional enteritis. At this time the spleen was palpably enlarged to about three times the normal size. After this operation the patient felt well for about a year.

Present Illness.—Several months before admission to the hospital for the present illness he began to suffer with occasional attacks of cramplike pain in the lower part of the abdomen, accompanied by diarrhea. In the past month he had had several such attacks, and stated that he had observed blood in his stools.

Physical Examination.—The patient appeared fairly well nourished but obviously ill, with anemic coloration of the skin and mucous membranes. He was in a state of severe prostration. Examination of the systems failed to reveal any noteworthy signs, masses or lesions.

Course in the Hospital.—There was a low-grade fever. Abdominal discomfort continued, and on several occasions gross blood was observed in the stools. The blood count was as follows: red blood cells, 1,600,000 per cubic millimeter; hemoglobin, 16 per cent; white blood cells, 16,800 per cubic millimeter, the differential count showing 80 per cent neutrophils. A smear revealed many nucleated red blood cells. Anisocytosis, poikilocytosis, achromia and polychromatophilia were observed. The hematocrit reading was 12. The icterus index was 6.6; red blood cell fragility, normal; the urine contained no abnormal elements; the value for serum proteins was 5.8 Gm., with globulin 2.5 and albumin 3.3. The cephalin flocculation test gave negative results. The value for serum phosphorus was 3.1 mg., that for alkaline phosphatase 9.4 units and that for acid phosphatase 0.2 units. On subsequent examination a large number of nucleated red blood cells were observed in all blood smears. Several blood transfusions were given. The patient's condition did not improve, and on account of the continued loss of blood from the intestinal tract an abdominal operation was performed on Jan. 13, 1944.

When the abdominal cavity was opened there were considerable adhesions in the upper portion of the jejunum adjacent to the zone of resection, uniting it to the anterior abdominal wall in many places and involving also the omentum. About 4 liters of straw-colored fluid was present. The liver was smooth but pale; the gallbladder was distended and thin-walled, and no evidence of calculi was apparent. The stomach appeared normal throughout the entire zone that could be palpated, and there was no evidence of ulceration in the region of the pylorus and the duodenum. There was no enlargement of any mesenteric or retroperitoneal lymph nodes. The spleen was obviously greatly enlarged, measuring approximately 25 cm. in length and having considerable thickness. In order to removve the spleen a transverse incision was made, and after the release of adhesions the spleen was delivered and separated. Blood transfusions were administered during the operation.

Pathologic Report.—The spleen weighed 1,080 Gm. and measured 25 by 12 by 6 cm. The capsule was markedly thickened and the pulp soft and friable. There were no discrete foci on the surface or on section.

Microscopic Examination.—The malpighian corpuscles were distinct and of considerable size. The arterioles in their centers were frequently thick-walled and hyalinized. The sinuses were sharply outlined and distended with blood. The pulp was abundant and vascular and contained many foci of myelopoietic cells. There were some giant cells with large single or multiple nuclei, having the characteristics of megakaryocytes. There were groups of large mononuclear cells with diffusely scattered chromatin, occasionally with nucleoli and showing basophilic cytoplasm. These cells had the appearance of myeloblasts. There were also obvious myelocytes present, some of which were eosinophilic. Occasionally, groups of nucleated red blood cells were noted, some of them of the prenormoblast type, but others apparently less mature. There were also many nuclear fragments.

Pathologic Diagnosis.—The diagnosis was myeloid metaplasia of the spleen (agnogenic).

Postoperative Course.—The general condition improved rather rapidly. Ten weeks after operation the red blood cell count was 4,000,-

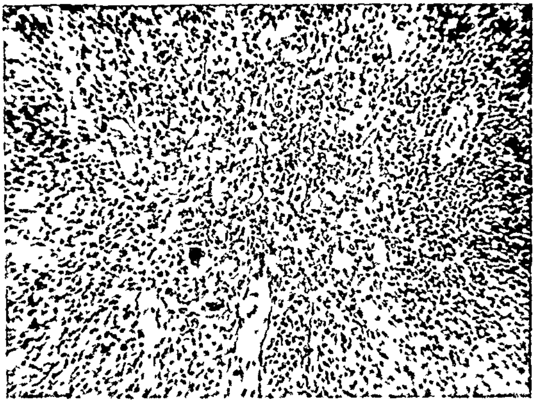

Fig 1—Photomicrograph of spleen The lymphoid tissue is preserved (right) In the pulp are (1) a megokaryocyte and (2) groups of myelo cytes and normoblasts

000 per cubic millimeter, with 11 Gm of hemoglobin, and the white blood cell count was within normal limits Four weeks later the patient was discharged as cured and returned to his normal occupation

REPORT OF FOLLOW-UP

M R was admitted to the Marine Hospital, Staten Island, on Feb 1, 1949, five years after splenectomy His chief complaint was of a burning sensation in the lower part of the left leg He stated that in 1945, after trauma, a blood clot had formed in the skin along the lower medial aspect of the left leg Since then he had had intermittent ulcerations of the lower part of the leg, just above the medial malleolus

The patient was now 44 years of age Examination revealed his blood pressure in millimeters of mercury to be 135 systolic and 90 diastolic Other examinations gave essentially negative results except for the abdominal scar and varicose veins of the lower part of the left leg The patient was obese He had a varicose ulcer of the lower third of the left leg, medial aspect, 2 cm in diameter No lymph nodes were palpable

The patient was operated on for varicosities of the lower part of the left leg by high ligation of the saphenous vein

Laboratory examinations of the blood showed platelet count, 140,000, bleeding and coagulation time, normal, red cell count, 4,500,000, with 14 Gm hemoglobin, hematocrit reading, 44, *Mazzini and Kahn reactions*, negative, prothrombin time, 40 per cent of normal, sedimentation rate, 5 mm , white cell count, 10,000, differential count, normal, urine, normal

Roentgen examination of the pelvis and the upper thirds of both femurs on February 14 revealed entirely normal conditions The joint spaces were normal No evidence of pathologic change was seen Roentgen and fluoroscopic study of the chest and heart on February 4 showed an unusual configuration and considerable prominence of the right border The pulmonary arteries seemed slightly enlarged and had very wide pulsations However, there seemed to be no prominence past the trunks The transverse cardiac measurement was 155 mm and the predicted measurement about the same The impression was that comparative pulmonary hypertension was present, associated with some enlargement of the right ventricle and/or the right auricle The contours of the lower half of the barium-filled esophagus were unusually irregular and suggested the presence of varicosities Examination of the esophagus should be repeated, with concentration on this possibility.

Biopsy of the sternal bone marrow showed abundant cellular elements of normal cell types. The myeloid-erythroid ratio was 3:1. Megakaryocytes were present.

COMMENT

Myelopoiesis occurs in many circumstances in areas outside the bone marrow. It has been noted in association with some infectious states, such as scarlet fever and generalized sepsis; with carcinomatosis heavily involving the bones, and with conditions associated with osteosclerosis in which the bone marrow is replaced. In the presence of myelogenous leukemia the extramedullary myelopoiesis reaches its greatest height and involves the liver, spleen, lymph nodes and many other organs. In this disease, however, the condition is that of infiltration by abnormal and immature leukocytes of a single type, or originating from a single branch of the blood-forming cells. By the use of the term "agnogenic myeloid metaplasia of the spleen" a concept has been created that splenomegaly of this variety is of a single type, and a common prognosis may be given. On the contrary, in our view, a study of the case reports grouped under this title shows a great variety of clinical backgrounds and types of disturbance of the peripheral blood. We believe that the only element in which these cases may be said to coincide is the histologic and pathologic character of the spleen itslf, consisting of splenomegaly, preservation of architecture, including malphigian corpuscles, and focal infiltrations by nests of myelopoietic elements, including those of the red cell series.

SUMMARY

A follow-up is reported of a case of agnogenic myeloid metaplasia of the spleen five years after splenectomy. The bone marrow and the peripheral hematologic picture were normal at this time.

ZUSAMMENFASSUNG

Es wird ueber die Nachuntersuchung eines Falles von agnogenischer myeloider Metaplasie der Milz berichtet. Fuenf Jahre nach Resektion der Milz fand sich ein normales Knochenmark und ein normales peripheres Blutbild.

RESUMEN

Se comunica un caso de esplenectomía por metaplasia mieloide agnogénica, con médula ósea y cuadros hematológicos periféricos normales a los 5 años.

RÉSUMÉ

On rapporte ici l'évolution d'un cas de métaplasie myéloide agnogénique de la rate cinq après une splénectomie, présentant une moelle osseuse normale et des images hématologiques périphériques.

RIASSUNTO

Riporta un caso esequito 5 anni post splenectomia di metaplasia mieloide agnogenico della milza, con quadri normali di midollo osseo ed ematologia periferica a quest'ora.

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Diverticula of the Small Intestine

Report of a Case of Jejunal Diverticulum

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NONMECKELIAN diverticula of the small intestine are relatively rare. They represent the most infrequent types of diverticula of the gastrointestinal tract. According to Ritvo and Votta,[1] the over-all incidence of small bowel diverticula is 0.5 per cent, while similar lesions in the colon have an incidence of 3 to 10 per cent. Nonmeckelian diverticula occur more frequently in the jejunum than in the ileum. Benson, Dixon and Waugh[2] reported 122 cases of nonmeckelian diverticula of the small intestine, 100 in the jejunum, 17 in the ileum and 5 in both.

The diverticula are frequently classified as congenital or acquired. Bunch[3] claimed that congenital diverticula of all types occur in one of every 200 persons, that they are usually single and occur on the antimesenteric border of the bowel, deriving from residue of the vitelline duct. Acquired diverticula, on the other hand, are rare, appear anywhere on the bowel and tend to occur in persons of middle age or older. Congenital diverticula have all the constituents of the bowel wall, whereas the acquired type consists of the mucosa and serosa, so that it really represents a herniation of the mucosa proper through its investing muscularis layer.

The majority of nonmeckelian diverticula of the small intestine are located on the mesenteric border of the bowel. It is believed that a weak place in the intestinal wall about the entrance of blood vessels, plus intraintestinal tension, is a predisposing factor in the development of diverticula. The mucosa is pushed out through these areas of lessened resistance. Consequently, defective muscular development may be a definite etiologic factor.

Mahorner and Kisner[4] reported 2 cases of multiple jejunal diverticula occurring on the mesenteric side, outpouchings between the serosal layers of the mesentery. The diverticula, in relation to the line of attachment of the mesentery, were alternately a little to one side and then the other. The authors stated that the blood vessels alternate irregularly, first on one side of the central line of attachment and then on the other.

The diverticula may be solitary or multiple.[5] Not infrequently they are associated with diverticula of the colon, duodenum, esophagus or bladder.[6] Other congenital anomalies, such as Meckel's diverticulum, malrotation of the intestines, exstrophy of the bladder and hemangioma of the liver, may be associated with them. They may be found in all age groups.

Symptomatically they may cause vague gastrointestinal complaints of the type frequently referred to as flatulence. Epigastric pain and discomfort accompanied by a sensation of "gas on the stomach" after meals have been described. The pain at intervals has been severe and associated with nausea and vomiting. There may be no symptoms at all; in such cases the diagnosis is incidental, the diverticula being discovered on routine gastrointestinal roentgen examination, during celiotomy for other conditions or during necropsy after death from other causes. The more serious symptoms result from complications.

The most common complication of nonmeckelian diverticula is intestinal obstruction.[7] Obstruction has resulted after enterolith formation[8] within a diverticulum; diverticulitis[6d] has been frequently reported.[9] Intestinal hemorrhage[10] has been noted, as well as rupture of a diverticu-

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lum,[11] either traumatic or spontaneous. Perforation following inflammatory change has been reported often.[12] Benson, Dixon and Waugh[2] listed foreign bodies, neoplastic disease and heterotopic tissue formation as further complications. Edwards[13] reported a case of malignant tumor formation in the neck of a diverticulum.

The majority of diverticula are symptomless and hence are not discovered except incidentally. Ritvo and Votta,[1] however, in a period of two and a half years, observed 25 cases during 4,786 routine gastrointestinal roentgen studies. Since Rosedale[14] observed 3 cases of jejunal diverticula in 5,000 autopsies, and Edwards[13] reported similar cases in 2,820 autopsies, one is impelled to inquire: are these lesions diagnosed or discovered frequently enough? The incidence reported by Ritvo and Votta[1] causes one to question the completeness of the ordinary gastrointestinal barium study. The infrequency of these observations at necropsy may mean that the great majority of the lesions are not discovered because the small bowel is not distended with air. It is reasonable to assume that these lesions, which, more frequently than not, lurk between the leaves of the mesentery, are easily overlooked. They may better be located after distending the bowel with air, as has been recommended by Mahorner and Kisner[4] in searching for duodenal diverticula during operation.

Intussusception of the small intestine is not rare. Kahle[15] discussed 151 cases of intussusception, including the probable causes in each. Though a Meckel's diverticulum was presumably the causative factor in 6 cases, no mention was made of a nonmeckelian diverticulum. Good[16] reported the roentgenographic diagnosis of chronic intussusception of the small intestine, in 1 instance due to an invaginated Meckel's diverticulum. Harkins[17] reported 2 cases and reviewed 160 cases collected from the literature of intussusception due to invaginated Meckel's diverticulum. Froelich and Coe[18] reviewed the literature from 1852 to 1936, and found to that time a total of 3,284 cases of intussusception, in 462 of which the condition was of the enteric type. Of these only 29 were jejunal, an incidence of 0.9 per cent. The authors discussed the 29 cases, including the etiology. Eleven were due to a polyp, 1 to a lymphosarcoma, 1 each to a sarcoma, a lipoma, a subperitoneal lipoma, a myoma, a papillary adenoma, a fibroadenoma, a fibroma, enlarged mesenteric glands, a leiomyoma, an adenocarcinoma, an infiltrating papilloma and a small tumor of the jejunum. Five were of undetermined origin. The case here reported is the first to our knowledge of intussusception of the jejunum due to a nonmeckelian diverticulum.

REPORT OF CASE

A 32-year-old Negro housewife was admitted to a medical service of the Cook County Hospital on Oct. 4, 1946, with an admitting room diagnosis of pyloric obstruction. She complained of paroxysmal epigastric pain, which radiated to the lower part of the abdomen and the interscapular region. It was associated with vomiting, the vomitus being green and bitter. The symptoms were of five days' duration, but several similar episodes had occurred in the year prior to admission. There had been no bowel movement for two days.

Physical examination revealed the patient to be well developed and well nourished. She did not appear acutely ill. The temperature was 98.2 F., the pulse rate 72 and the respiratory rate 20. The tongue was moist but coated; the lips were dry and cracked. The blood pressure was 122 systolic and 74 diastolic. The abdomen was slightly distended in its upper half. Tenderness was present under the right costal margin, and a plum-sized, mobile cystic mass was palpable in the upper part of the abdomen. The liver, kidneys and spleen were not palpated. Other conditions were within normal limits. A diagnosis of chronic cholecystitis with partial small bowel obstruction was made. The patient was treated by Wangensteen suction and intravenous fluids. She was much improved by the following day. A laboratory work-up revealed the urine to be dark but otherwise normal. The value for blood hemoglobin was 73 per cent, the red blood cell count 4,600,000 per cubic millimeter. The white blood cell count was 7,100; the differential count revealed polymorphonuclear leukocytes, 51 per cent; eosinophils, 6 per cent, basophils, 2 per cent; lymphocytes, 36 per cent, and monocytes, 5 per cent. The value for blood nonprotein nitrogen was 38 mg. per 100 cc., and the blood Wassermann reaction was negative. Roentgenographic study revealed retained fluid, but no intrinsic lesion was demonstrable in the stomach, although the prepyloric region appeared narrowed. A twenty-four hour film revealed barium still present in the stomach, but some had passed into the ileum. In this film a soft tissue shadow was present that seemed to push part of the small bowel to the right. The diagnosis was partial pyloric obstruction and soft tissue mass of undetermined nature in the right upper quadrant. The Graham-Cole study revealed a nonvisualizing gallbladder.

The patient had intermittent periods of vomiting, and on October 11 she was transferred to the surgical service. *At operation*, on October 12, the following were found: (*a*) chronic cholecystitis—the gallbladder had a long mesentery, was very mobile and was the mass palpated abdominally; (*b*) intussusception, easily reducible, of the upper jejunum, caused by (*c*) a jejunal diverticulum inverted into the lumen of a right-sided, malrotated jejunum continuous with a totally right-sided duodenum; (*d*) malrotation of the colon, with left-sided residence of the colon, including the cecum and appendix; (*e*) cystic dilation of the common bile duct, and (*f*) absence of the gastrocolic omentum.

The diverticulum was located about 15 cm. distal to the ligament of Treitz. The intussusception involved about 30 inches (76.2 cm.) of jejunum. The diverticulum was 5.5 cm. long, 5 cm. in circumference and about 4 cm. in circumference at its base. The jejunum was dilated to about three times normal size. The diverticulum was resected, and the jejunum was closed with interrupted silk in two layers. The gallbladder and the appendix were removed.

Microscopic study of the diverticulum revealed it to be composed of jejunal mucosa and serosa. No muscular layer was noted. The gallbladder revealed chronic cholecystitis.

The patient made an uneventful recovery and was discharged fifteen days after exploration, relieved of her complaints.

COMMENT

The diagnosis of nonmeckelian diverticulum is difficult at best. The complications of this lesion no doubt cause symptoms that supplant or veil the original complaints. Perhaps many vague abdominal complaints are due to diverticula unsuspected and undiagnosed because of less than minute roentgenographic observation. Apparently the most constant factors associated with this type of lesion are other anomalies—other diverticula of the gastrointestinal tract, malrotation of the intestine and diverticula. The presence of such anomalies might suggest nonmeckelian diverticula of the small intestine. In the case here reported the diverticulum was associated with many congenital anomalies, which might have suggested the true diagnosis. It was without a muscular layer and hence was of the acquired type.

SUMMARY

1. A case of acquired diverticulum of the jejunum is reported. The diverticulum was inverted into the lumen of the jejunum, causing an unusual complication, chronic intussusception.
2. There were associated anomalies: a gallbladder on a mesentery; malrotation of both the small and the large bowel; congenital cystic dilatation of the common bile duct, and absence of the gastrocolic omentum.
3. The intussusception was reduced, the diverticulum was resected and the jejunum was repaired.
4. The gallbladder and appendix were removed. The patient made an uneventful recovery.
5. This is believed to be the first reported case of a jejunal nonmeckelian diverticulum with a complicating inversion and intussusception.

RESUMEN

1. Se comunica un caso de divertículo yeyunal adquirido. La inversión diverticular en la luz yeyunal produjo intususcepción crónica [illegible] m [illegible]cación inusitada.

2. Hubieron anomalías asociadas: colecisto con meso, malrotación del intestino delgado y del intestino grueso, dilatación quística congénita del colédoco y ausencia del epiploon gastrocólico.

3. La intususcepción fué reducida, el divertículo extirpado y el yeyuno reparado.

4. El colecisto y el apéndice fueron extirpados. Recuperación sin incidentes del paciente.

5. Se cree que sea el primer caso dado a conocer de divertículo no meckeliano yeyunal complicado con inversión e intususcepción.

RÉSUMÉ

1. On rapporte un cas de diverticule aigu du jéjunum.—Le diverticule étant inversé dans la lumière du jéjunum, causant par là une complication inusitée, de l'invagination chronique.

2. Il y avait aussi d'autres anomalies associées: la vésicule biliaire étant accolée au mésentère; le petit et le gros intestin en mal rotation; dilatation congénitale kystique du canal biliaire; absence de l'épiploon gastrocolique.

3. L'invagination fut réduite, le diverticule réséqué et le jéjunum séparé.

4. La vésicule bilaire, l'appendice furent enlevés. L'évolution post-opèratoire du patient fut normale.

5. L'auteur est d'avis que c'est le premier cas de ce genre rapporté où un diverticule du jéjunum, non de Maeckel, présentait une inversion ou une invagination.

ZUSAMMENFASSUNG

1. Es wird ein Fall eines erworbenen Divertikels des Jejunums mitgeteilt. Das Divertikel hatte sich in die Darmhoehle des Jejunums eingestuelpt und verursachte die ungewoehnliche Komplikation einer chronischen Teleskopierung.

2. Es fanden sich andere Anomalien, naemlich eine mit einem Mesenterium versehene Gallenblase, eine unvollkommene Drehung des Dick-und des Duenndarms, eine angeborene zystische Erweiterung des Ductus choledochus und das Fehlen des gastrokolischen Omentum.

3. Die Teleskopierung des Darmes wurde reduziert, das Divertikel entfernt und der Duenndarm geschlossen.

4. Gallenblase und Blinddarm wurden entfernt. Der Kranke erholte sich ohne Zwischenfaelle.

5. Es wird angenommen, dass hier der erste Bericht ueber ein je jungales Divertikel vorliegt, das kein Meckelsches Divertikel ist, und das zu den Komplikationen einer Einstuelpung und Teleskopierung gefuehrt hat.

RIASSUNTO

1. Riporta un caso di diverticolo del digiuno acquistato. Il diverticolo inverso dentro l'ansa del tenne, causando una complicazione straordinaria, intuscepzione cronica.

2. Vi erano anomalie associate; una cistifellea sul mesentere; malrotazione entrambi tenue e grosso intestino; dilitazione cistico congenito del coledoco ed assenza del omento gastrocolico.

3. L'intuscepzione svaginata, il diverticolo estirpato, ed il digiuno riparato.

4. La cistifellea ed l'appendice furono rimossi. Il paziente fece un ricovero poco fecondo d'avvenimenti.

5. Si crede di essere il primo caso riportato di diverticolo dell digiuno nonmecklian con interzione ed intuscepzione complicandolo.

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Factors Related to Avoiding Colostomy for Lesions of the Rectosigmoid

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OMAHA, NEBRASKA

A DISCUSSION of lesions involving the rectosigmoid immediately introduces the subject of whether bowel continuity can be reestablished after extirpation of the lesion. If the lesion is benign and it is technically feasible the decision is easily made, but with malignant lesions a controversy exists. There is also some controversy about the location of the rectosigmoid, or, in other words, about where the sigmoid ends and the rectum begins. As related to the distance from the external anal margin, it is practical to assume that this distance varies between 10 and 15 cm. From the point of view of applied anatomy the rectosigmoid should be considered to be at the level where the sigmoid mesentery disappears, this usually being where the peritoneum is reflected from the bowel surface anteriorly to form the peritoneal floor of the pelvis. It is my interpretation that most surgeons consider the lesion to be rectosigmoidal if it is palpable and visible at the peritoneal reflection on the floor of the pelvis, and I believe that this should be accepted for the purpose of records.

The benignity or malignancy of these lesions can usually be determined before operation or at the operating table. Benign lesions of the rectosigmoid are encountered infrequently, and with modern surgical technic, the use of antibiotics and blood, and the proper preoperative and postoperative treatment it should be most unusual for any patient with a benign lesion to be subjected to a permanent colostomy. A localized stricture not associated with diffuse ulcerative colitis may be resected and bowel continuity reestablished. Lipoma, fibroma or myoma, if an integral part of the bowel wall, will probably require segmental excision unless the lesion can be enucleated. If such a tumor has a pedicle, it can sometimes be removed through the proctoscope or by sigmoidotomy. If microscopic study reveals low grade malignant changes in a polyp with no invasion into the pedicle, the pedicle stump should be thoroughly fulgurated and the area observed every three months for two years. When the adenoma or papilloma has a broad base attachment—the so-called sessile type—even though biopsy reveals no malignant changes, I advise rectosigmoidectomy with anastomosis, for malignant changes are frequently present in the base of such a tumor.

Surgeons have witnessed a changing concept in the management of malignant lesions of the rectosigmoid during the last ten years, and particularly during the last five. Since acceptance of the Miles doctrine in 1908 it has been almost universally agreed that abdominoperineal resection with a permanent colostomy was the only operation to be considered for adenocarcinoma of the rectosigmoid. There have been a few individual exceptions, in which surgeons rather toyed with sphincter-preserving operations in selected cases. These were usually multiple stage procedures, some surgeons removing less bowel and accomplishing an anastomosis, a few[1] experimenting with anastomosing the ileum to the lower rectum and anus, while others, notably Babcock[2] and Bacon,[3] rejuvenated the pull-through operation of Hochenegg but with modifications and improvements in technic. More frequently than not, surgeons experimenting with sphincter-preserving procedures hesitated to report or publish their material be-

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cause of the wide divergence from the enthusiastically supported abdominoperineal operation with sacrifice of the sphincter mechanism. *In other words, the surgeon* who attempted to deviate from the abdominoperineal resection faced a psychological barrier. This factor is important, because, after one has developed a technic for an operation whereby it is no longer a difficult procedure for him in most instances, he is reluctant to change. This is true particularly if a new technic has not been proved to give better results and if it is technically more difficult and involves more potential complications. However, the individual comforts and rights of the patient must not be forgotten. Probably he should have some voice in the matter.

The lymphatic *pattern of this region* must be given serious consideration. Possibly recent restudy of the anatomy of the lymphatics and evaluation of the pathologic reports on lymph gland involvement in malignant lesions of the rectosigmoid will lend support to preserving the sphincter mechanism more frequently than has been done in the past.

In 1922, McVay[4] reported his study of lymph node involvement in 100 cases of carcinoma of the rectum and stated that in only 1 case had malignant cells been observed in a lymph gland 1 cm. or more below the lower margin of the lesion. Since then, reports have gradually accumulated which further substantiate the infrequency of downward spread of rectal and rectosigmoidal carcinomas. In 1948,[5] I tabulated 607 carefully studied cases of lymph gland *involvement* reported by other authors; in only 5 of these had involvement of lymph glands occurred more than 2 cm. below the lower margin of the lesion, an incidence of 0.82 per cent. This figure includes the studies of McVay[4] in 1922; Gabriel, Dukes and Bussey[6] in 1935; Gilchrist and David[7] in 1938; Coller, Kay and MacIntyre[8] in 1940; Grinnell[9] in 1942 and 1950 and Glover and Waugh[10] in 1944. Since the reports of Clogg[11] in 1904, Cole[12] *in 1913, Cheatle*[13] *in 1914, and others* as well as the aforementioned. It has been appreciated that intramural extension in the longitudinal axis of the rectum and colon is rarely more than 2 cm. from the *palpable and visible margin of the tumor.* Some consideration must be given these reports when one is selecting the operative procedure for malignant rectosigmoid lesions. With the aforementioned data, it does not seem logical that 5 inches (13 cm.) of rectum below the apparent *margin of safety* should be sacrificed and the sphincter mechanism extirpated when the *malignant lesion* is located at the rectosigmoid level. This concept is gradually becoming more widely accepted. It would seem a better procedure to excise tissue lateral to the tumor rather than below it at this level.

During the last several years we have been *studying the* lymphatic pattern of the rectum and rectosigmoid regions by *undertaking a critical review* of the literature and by India ink injections in animals and human fetuses. This work has been reported in detail elsewhere.[14] It not only substantiated some work previously done but clarified the pattern for the lymphatics of this region. This investigation emphasized the lateral spread of lymphatic channels along the upper and lower surfaces *of the levator ani muscles and their* extension to lymphatic structures in the lateral pelvic walls in the region of the hypogastric vessels. The direction of spread could always be interpreted as upward and lateral. In the region of the rectosigmoid, one could only conclude that lymphatic flow was first toward the intermediate and central nodes along the superior hemorrhoidal vessels and less extensively along the marginal vessels until a block *occurred in the intermediate and central* group of lymphatics.

This brings us to some technical factors in operations for malignant lesions at the rectosigmoid level. At present I do not favor any type of pull-through operation for lesions in this area, but prefer some *type of anastomotic procedure.* Generally speaking, a closed type of anastomosis *would be preferable* to keep the incidence of infection at a [illegible] although that is not so much a factor in these days of antibiotics. Also, the factor of recurrent carcinoma must be considered, based on the probability that cancer cells will be released into the lumen of the bowel and escape from it with the open type of anastomosis. It is true that in doing a closed type of anastomosis one tends to be too conservative in applying the anastomosis clamps in the hollow of the sacrum. I believe it better to err on the side of doing an open anastomosis, with its resultant minimal leakage, than to be too conservative in the use of clamps and the excision of potential cancer tissue in the closed type of anastomosis.

It has been my experience that proper control of the lower rectal segment at the time of transection is most important if one wishes to be sure of the level of transection below the tumor margin and to keep rectal leakage at a minimum. Special right angle clamps[14a] have been devised for this purpose. As has been stated, with any type of open anastomosis some contamination takes place, but in my opinion this danger of infection is definitely lessened by preoperative preparation of the patient with those antibiotics which reduce the intestinal flora. To date, even with the introduction of new antibiotics, I have always returned to sulfasuxidine or sulphathaladine. Occasionally streptomycin is used for a day or two prior to operation. When there is potential or threatening obstruction by the rectosigmoidal lesion I prefer to use sulfasuxidine, because it tends to cause a looser stool. The usual routine of low residue diet, saline catharsis every other day and daily warm saline enemas is followed. On the night prior to operation, nasogastric suction is instituted for further decompression of the gastrointestinal tract. The patient's condition has been evaluated with the completion of the physical examination and the laboratory studies.

The type of incision has varied in my patients. I use either a left paramedian or a low transverse crescent incision. The latter heals more kindly, but one is at some disadvantage in mobilizing the left colon and the splenic flexure unless the incision is made to flare upward on the left side. Also, the incision is not extended too far to the left and upward until it has been ascertained that the lesion is resectable and a sigmoid colostomy will not be necessary. If a colostomy is indicated, it is made through a small left paramedian incision near the level of the umbilicus, or a colostomy of the transverse colon is accomplished through a small upper abdominal incision.

It is my custom first to incise the lateral peritoneal reflection of the sigmoid and left colon and then to expose the left ureter. This permits one to lift the sigmoid upward and view the vessels of the mesosigmoid. The superior hemorrhoidal artery is ligated at the level of the promontory of the sacrum or just above it; usually this ligation is made just below the level of the first sigmoid vessel or left colic vessels. Consideration must be given to proper vascularization at the anastomosis level, but at the same time adequate excision of the gland-bearing area must be done. One must visualize the length of bowel necessary to reach the rectal stump. Release of the splenic flexure is necessary at times. I then proceed to divide the peritoneal reflections as in an abdominoperineal resection. The tissues in the concavity of the sacrum are separated to the tip of the coccyx. For malignant lesions at the rectosigmoidal level, I free all structures laterally and anteriorly to a level at least 3 cm. and preferably 5 cm. below the palpable margin of the tumor. The special clamps are applied, and a small opening is made in the free area of the rectum between the two lower clamps. A suction tube is placed in this opening to remove all rectal contents. Transection of the rectum is then completed. I remove the crushing clamp below the lesion immediately to observe the lower margin of the lesion and make sure that no malignant tissue has been transected. The sigmoid is then transected near the level of the ligated vessels. The two clamps which have steadied the lower rectosigmoid are then replaced with catgut guide sutures to suspend the open rectal stump in the pelvis The anastomosis is begun by placing seven to ten catgut guy sutures through the posterior aspect of both bowel ends in such a way that the knots will be on the mucosal surface [14a] After the sutures have been placed, the upper segment slides down on these sutures to meet the lower segment, and the sutures are tied One similar suture is then placed anteriorly The anastomosis is completed by placing a single row of interrupted figure-of-eight silk sutures anteriorly and laterally, if possible, several sutures are placed posteriorly A rubber drain is placed deep in the concavity of the sacrum, to be delivered later through a small incision alongside the coccyx The peritoneal floor is reestablished A cecostomy or appendicostomy is accomplished by bringing a large mushroom catheter (No 32 or 34) out through a stab incision After the abdomen is closed, a small incision is made alongside the coccyx and the drain is delivered

The posterior drain is removed on the second postoperative day The cecostomy tube is not removed until about the tenth day, or until one is certain that the anastomosis is satisfactory The patient is given penicillin and streptomycin postoperatively

Some surgeons question the need for decompression by either cecostomy or colostomy, while others believe that complete diversion of the fecal stream by a colostomy is necessary I am convinced that some type of decompression is essential and that a cecostomy is a happy medium I keep the cecostomy tube connected to a suction apparatus when the patient is in bed, and recommend that it be irrigated several times daily with an ounce of warm water to dislodge any feces or the mucosa from the end of the tube This is much more comfortable for the patient than a nasogastric or nasointestinal suction tube

The necessity of establishing posterior drainage has also been questioned Some leakage occurs in enough cases to convince me that a drain is indicated, and dependent drainage is the better choice I have noted a certain amount of fecal or probably fecal drainage in about 20 per cent of cases, but I have had to resort to temporary colostomy on only two occasions in a series of 46 rectosigmoidectomies Also, in this series I have reoperated upon 6 patients for recurrent carcinoma, and in 3 instances was able to carry out an abdominoperineal resection In the other 3 cases, either the lesions were inoperable locally or metastasis was so extreme that a colostomy was done

At present I am reviewing and analyzing my cases of rectal and rectosigmoidal cancer, but I do not have sufficient data to arrive at any conclusion about three-year and five year recurrence rates In general, it does not appear that the curability percentage will show much change from that obtained with abdominoperineal resection

SUMMARY

The author discusses possibilities in the avoidance of colostomy for lesions of the rectosigmoid His own operative technic is described in detail

RESUMEN

El autor discute las posibilidades para evitar la colostomia en lesiones del rectosigmoide Describe en detalle su tecnica operatoria

RIASSUNTO

L'A discute le possibilita' di evitare colostomia per lesoni dell' S iliaca Descrive in particolarita' il suo tecnico operativo

RESUME

L'auteur discute des possibilites d'eviter la colostomie pour les lesions du rectosigmoide Il decrit en detail sa technique personnelle

ZUSAMMENFASSUNG

Der Verfasser eroertert die Moeglichkeiten, bei Erkrankungen des tosigmoids die Anlage eines Anus praeternaturalis zu vermeiden und beschribt ausfuehrlich seine eigene Operationstechnik.

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Some Observations on Convergence

J ALEXANDER VAN HEUVEN, M D
NEW HAVEN CONNECTICUT

MOVEMENTS of the eye are never produced by the action of one muscle alone Any movement of a single eye is the product of a complicated mechanism involving all six external muscles of that eye This mechanism shows an intricate play of contraction of muscles and relaxation of antagonists (Sherrington[1]) The two eyes are always moved simultaneously, since the innervation involved really deals with the external muscles of both eyes at the same time, making it even more intricate (Hering[2])

In discussing ocular movements one uses the terms ductions, versions and vergences This nomenclature would simplify matters if different authors would use these terms in the same sense Ductions are movements of one eye alone during occlusion of the fellow eye Versions are movements of the eyes in the same direction Vergences are movements of the eyes in opposite directions These disjugate movements "are required to maintain fixation at different distances of the fixation point from the eyes they thus take the fixation reflex out of the two- into three dimensional space" (Duke-Elder[3])

This paper deals with convergence only In convergence of the eyes two cortical centers are involved, one in the frontal and one in the occipital lobe The first ontrols voluntary convergence, the lat-er, convergence as a reflex movement onvergence may be reflex or voluntary very normal person shows reflex con-ergence, many are able to converge vol-ntarily By intensive training unusual nditions can be achieved An unusual ample of this statement was shown by ex-soldier of World War I, who, start- as a malingerer, had developed in the course of six years a number of voluntary controls over muscles which normally are entirely under involuntary control He made a living by showing these to medical societies I had the opportunity of examining him and found that, among other tricks, he showed complete voluntary control over his pupils He did this by a psychosomatic reflex and explained that in widening his pupils he thought of something gruesome and in narrowing them visualized looking into a bright light Cases of voluntary nystagmus have also been described [4]

Convergence as a reflex, or involuntary convergence, is a response to fundamentally different kinds of stimuli, three of which can easily be recognized

First, a certain amount of tonus of the eye muscles is required to keep the eyes parallel in the primary position

Second, convergence is intimately related to accommodation

Third, the desire for fusion plays an important role in stimulating convergence The psychological factor of attention in fusion is important (van Heuven [5])

In more than one respect, convergence stands alone among the various ocular movements Besides being the only one which can be controlled voluntarily, it represents phylogenetically the youngest faculty of the eye movements As such it is unstable, plastic and modifiable It is also unique in its relations to accommodation

It is hard to define a normal convergence power It varies in different persons and in the same person at different times Different methods of testing again result in different values After thorough search of the literature Scobee[6] concluded that at 20 feet one might consider a "normal" overcoming a prism of 20 prism diopters base out as a limit before breaking fusion Af[illegible] fusion is

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om the Department of Surgery Section on Oph nology Yale University School of Medicine
bmitted for publication Oct 10 1950

broken and the strength of the prism is gradually decreased, refusion should "normally" be reestablished at 10 prism diopters. At a distance of 13 inches normal fusion will break at a prism of 30, and fusion will be reestablished with a prism of 20 prism diopters. Scobee stresses the fact that prism tests are tests of fusion, not of muscle power. This helps to explain the difference noted with different tests and under different circumstances.

Convergence insufficiency and convergence excess are of clinical importance.

Convergence Insufficiency.—The clinical importance of convergence insufficiency has long been recognized by various authors since the time of von Graefe[7]; it failed, however, to become commonly appreciated and used clinically. There are good reasons for this. The confusion existing with regard to its connection with the action of the external eye muscles has been great. In studying the clinical picture of convergence insufficiency there is no strict parallel in the appearance and disappearance of signs and symptoms. The relation of accommodation and convergence, especially a deviation of the two, has of itself given rise to complaints. Finally, vague complaints of eyestrain can be typically on a neuropathic basis, to such an extent that the picture can be often entirely dominated by it.

The symptoms are fatigue after close work for a certain period; inability to read for a considerable time; "eyestrain"; headaches after indoor work while in outdoor work there is no complaint; awareness of one's eyes and of the fact that they have to do strenuous work when looking at a close distance; occasional dizziness; and the feeling that the eyes must voluntarily keep working together. These symptoms vary greatly with the patient's general condition. Usually in the morning they are absent, coming on gradually as the day goes by and in proportion to the amount of close work done. In times of fatigue, depression or general debility they are much more pronounced. The neurotic patient is keenly aware of them. In fact, they represent a group of typical neurotic complaints. It should be kept in mind that these complaints may be caused entirely by the constant strain exerted on the convergence mechanism in cases of convergence insufficiency. In mentally well balanced patients it causes great discomfort when they force themselves to read for a prolonged period.

The causes of these symptoms, if they represent the clinical entity of convergence insufficiency, may be manifold. They can be grouped under imperfections in the anatomic or physiologic character of the muscular apparatus itself, as the result of physical or mental weakness, or as a disturbance of the normal ratio between accommodation and convergence. As a rule, combinations of these factors may be found.

As far as the signs of convergence insufficiency are concerned, the main one is gradually increasing difficulty to converge adequately as the near point is approached. In convergence insufficiency the deviation is always larger at the near point than at a distance; in divergence excess the deviation for distance is greater than for near. Convergence insufficiency is usually relative; true complete paralysis is seldom seen. Roper[8] has reported a case of complete voluntary and reflex convergence paralysis caused by encephalitis. Diplopia for near vision and inability to converge remained constant.

In examining a patient suffering from convergence insufficiency with the Maddox rod at a distance of 20 feet one may encounter orthophoria or slight heterophoria. In testing with the Maddox wing at 13 inches one always finds exophoria much beyond the 6 degrees which are considered to be still normal. Determination of the near point of convergence in patients with convergence insufficiency is of relatively slight importance. If one defines the convergence near point as the distance in millimeters from the point of maximal convergence to the bridge of the nose, 40 mm. is supposed to represent a normal value. In convergence insufficiency this near point will be found beyond 95

"3. This exercise should not be performed before the former two are thoroughly mastered. Hold finger one foot from eyes and concentrate gaze just on top of it in the air. Without moving the eyes, remove the finger. Light should still be seen double.

"4. Perform exercise No. 3 but without finger at all. After exercises 1 and 2 exercises on the synoptophore and after 3 and 4 stereoscopic exercises may be helpful."

Both Stutterheim and Ida Mann, as well as many others, have obtained good results with these methods. Cushman and Burri[14] did both: prism exercises and finger convergence exercises for patients with exophoria greater for near vision than for distance; for patients with exophoria for near vision only; and in patients with a poor adduction-abduction balance. They obtained good results in 53 of 80 patients.

I prefer the pin-to-nose exercises to the treatment with a battery of prisms of increasing strength. It seems to me that exercises with a major amblyoscope are also helpful. The ideal treatment is to teach the patient his physiologic diplopia exercises and in the intervals to give him orthoptic treatments.

Personally I have been acquainted with the problem and Stutterheim's conception of its importance since 1930, as I happened to have as a patient an old friend of Stutterheim's with whom he regularly corresponded about the condition of his eyes. The patient was a high school mathematics teacher and had high hypermetropia combined with astigmatism and presbyopia. In the early days after Stutterheim's first publication in 1931, I experimented with his method on 3 patients and was not satisfied. After that I stopped using his method, and it was only after the appearance of Stutterheim's book *Squint and Convergence* (1942) and the publications of Ida Mann and Williamson-Noble that I realized my mistake in so doing. Since then I have been looking for suitable cases and have indeed found patients who could be helped by convergence exercises, obtaining great relief from their complaints of eyestrain.

My experience is not wide enough for statistical analysis, but some of my cases are reported in the accompanying table.

In my list of patients, some showed improvement of vision. This has been noticed by all authors on this subject; Stutterheim, Ida Mann and Williamson-Noble mention it. Livingston had the same experience in training men for the R.A.F., and Williamson-Noble has cited Basil Lang, who made the same observation. In discussing this improvement, Duke-Elder[15] suggested that "this sometimes may be due to the disappearance of small central areas of suppression developed to relieve the discomfort of diplopia".

Ida Mann suggested that the treatment eases the nervous path from the frontal cortex to the oculomotor centers, using conscious attention as the stimulus and the fixation reflex as the source of the impulse. In full appreciation of these statements, I think there is an additional psychologic factor. When patients are aware that there is something wrong with their eyes they are inclined to express this in terms of lowered vision. When the handicap is removed, this motive falls short and they enjoy better vision. I have seen the same thing happen in patients with a temporary constriction of the visual fields, nothing being wrong with the macular region.

A group that stands apart is composed of neurotic patients. The results of any new treatment may be extremely good but are seldom lasting. A thing to remember, however, is that some patients appear neurotic in their complaints but are not.

No ill effects have been seen from convergence training.

"Asthenovergence" is not the only answer to asthenopia, but it definitely is the answer for a certain group of patients with asthenopic complaints. It has the advantage of being detected easily. The experience of Stutterheim, Ida Mann, Williamson-Noble and others covers over 1,000 patients who have profited by these training exercises This stresses the importance of the simple tests for power of convergence in routine examination

Convergence Excess —Convergence excess is not uncommon The symptoms are difficulty in reading and headaches after close work They vary with the general condition of the patient, and real spasm may be observed in neurotic or hysterical patients This spasm of convergence is usually accompanied by miosis and excessive accommodation Sounders[16] emphasized the fact that the diagnosis of spasm of convergence cannot be made unless organic disorders have been ruled out The signs of convergence excess are 1 All ductions are normal

2 There is marked esophoria, relatively much greater for near vision than for far

3 Prism convergence is increased

4 Prism divergence is normal

As to the cause of convergence excess, one should consider first "excessive near work" in children as important A similar tendency is shown by myopic children, who usually keep their books too close As has been mentioned, many normal persons are able to converge voluntarily This may develop into convergence excess, thus, indiscriminate muscle training may do harm Generally speaking, one may say that in convergence excess the nervous factor plays a very important role

As to treatment, fair results may be expected in cases of convergence on the basis of excessive accommodation In those cases one begins by correcting the refraction and the heterophoria, and asks the patient to keep his close work at a good distance from his eyes Full attention should be paid to posture and illumination Duke-Elder stated that orthoptic treatment seldom is helpful, and Mayou advocated exercises inducing voluntary relaxation of convergence It is of extreme importance to obtain, in a patient with convergence excess, a good general physical condition and an optimum mental state

In 1941 Utermohlen[17] wrote several articles in which he claimed that he was able to help over 90 per cent of his patients complaining of labyrinthine vertigo, without surgical intervention, by prescribing a pair of weak prisms, base in This statement was received with skepticism My own experience with this method was reported in 1942 I saw a patient, a general practitioner, who had heard about Utermohlen's method and wanted me to do what I could for him He was suffering so much that he was unable to shave himself, because looking sidewise in the mirror invariably caused such vertigo that he thought he was going to fall In walking he had to stand still at times, or to grasp something, in order not to fall He did not dare to drive his own car, and he had decided to give up practicing I found normal vision in each eye after correction of his hyperopia, hyperopic astigmatism and slight exophoria He showed good ocular cooperation and had no nystagmus except when he turned his head abruptly In the media and fundi no abnormalities were detectable His fields for white and colors were normal, tension was normal in both eyes His age was 58 Following Utermohlen's suggestions, I prescribed a prism for each eye of 1 diopter, base in This resulted in a remarkable improvement He regained his self confidence to such an extent that he resumed his practice, was able to shave and lost his complaints entirely He practiced until he died of apoplexy, two years later

In 1946 Utermohlen read a paper on this subject for the French E N T Society, and recently Moulonguet and Ribers published a paper[18] on his work, with case reports showing excellent results

Utermohlen's technic is as follows He *does a routine examination of the eyes* and ears, followed by examination of the sense of equilibrium "A first impression of the patient's stability can be obtained *by asking him to stand erect with feet* against each other and eyes closed Some patients show at once a tendency to fall sideways This may even be the case when *the patient tries to stand on one foot with* his eyes open The next test is performed by turning the patient around his vertical axis, his head slightly tilted forward, and

Data on Treatment and Results

Patient	History	Vision Without Glasses	Corrective Glasses	Vision with Glasses	Maddox Rod at 20′	Maddox Wing & Vol. Converg.	Final Condition
D. W., 21 (accountant)	Headaches, eyestrain when working at night; has glasses, with which he can see well, but gets no relief	$\frac{20-1}{20}$ $\frac{20}{20-2}$	+0.50+0.50 ax. 90 +0.50+0.50 ax. 85	$\frac{20}{20}$ $\frac{20}{20}$	exop. 3°	8°-16° exop. poor vol. conv.	No headaches, no eyestrain; can work at night
R. T., 27 (housewife)	Headaches; dizzy; too tired to read at night, cannot concentrate	$\frac{20}{20}$ $\frac{20}{20}$	+.75 +.75	$\frac{20}{20}$ $\frac{20}{20}$	eso. 1°	13° exop., no vol. conv.	No complaints
N. T., 33 (teacher)	Headaches; has given up piano as career on account of impossibility of concentration on music; has had many glasses	$\frac{20}{20}$ $\frac{20}{20}$	+0.25+0.25 ax. 90 +0.25+0.37 ax. 90	$\frac{20}{20}$ $\frac{20}{20}$	exop. 4°	16° exop., no vol. conv.	No complaints, can play piano with comfort after day's work
M. A., 37 (engineer)	Headaches at irregular times, often on awaking; cannot concentrate on work when tired; eyes burn and get bloodshot	$\frac{20}{40}$ $\frac{20}{100}$	—0.50—0.25 ax. 180 —1.25—0.50 ax. 180	$\frac{20}{20}$ $\frac{20}{20}$	eso. 2°	15° exop., no vol. conv.	No complaints
O. L., 25 (lecturer)	Headaches; difficulty in reading with and without glasses for any length of time. "Having been reading for 20 min. without glasses it is a relief to put them on, but after another 20 min. in taking them off the eyes burn"	$\frac{20}{20}$ $\frac{20}{20}$	+1.25 +1.25	$\frac{20}{20}$ $\frac{20}{20}$	exop. 4°	16° exop., no vol. conv.	Doing splendidly
C. S., 19 (teacher)	Headaches; needs glasses but hates to wear them; wore glasses for 9 years	$\frac{20}{20}$ $\frac{20}{30}$	+0.50+0.50 ax. 60 +0.50+0.50 ax. 150	$\frac{20}{30}$ $\frac{20}{25}$	exop. 3°	10° exop., poor vol. conv.	Is now content with glass; vision $\frac{20}{20}$ in each eye
O. M., 42 (clerk)	Is abnormally tired by his work to such an exrent that from 2-4 times daily he is obliged to take a short nap; is a clever person and good worker	$\frac{20}{200}$ $\frac{20}{200}$	—2—0.25 ax. 180 —2.25	$\frac{20}{20}$ $\frac{20}{20}$	exop. 2°	19° exop., poor vol. conv.	Feels much better; does not tire as quickly; still takes nap after supper
R. O., 28 (typist)	Headaches, equally on working days and holidays; wears glasses constantly	$\frac{20}{150}$ $\frac{20}{150}$	—1.50—0.50 ax. 45 —1.50—0.50 ax. 135	$\frac{20}{20}$ $\frac{20}{20}$	exop. 4°	13° exop., no vol. conv.	No headaches; wears glasses no longer, at home or office
H. B., 16 (schoolboy)	Headaches when reading over ½ hour; needs glasses for reading and wears them all day long	$\frac{20-1}{20}$ $\frac{20}{20}$	+1.50 +1.50	$\frac{20}{20}$ $\frac{20}{20}$	esop. 2°	10° exop., poor vol. conv.	No complaints; wears no glasses
M. A., 28 (nurse)	Poor vision, not perfectly corrected by glasses; easily tired when doing close work; eyes feel strained, burn, occasional headache	$\frac{20}{100}$ $\frac{20}{70}$	+4+1.25 ax. 25 +3.50+1.50 ax. 35	$\frac{20}{40}$ $\frac{20+3}{40}$	exop. 3°	9° exop., poor vol. conv.	Vision with glasses now $\frac{20}{25}$ and $\frac{20}{20}$ No more strain

Data on Treatment and Results (continued)

Patient	History	Vision Without Glasses	Corrective Glasses	Vision with Glasses	Maddox Rod at 20	Maddox Wing & Vol Converg	Final Condition
P V 26 (*nurse*)	Needs glasses constantly but wants to get rid of them, cannot do close work at night easily tired no headaches	20/40 20/40	+2 25+0 75 ax 40 +2 50+0 25 ax 30	20/30 20—3/25	exop 2°	11° exop *poor vol* conv	Vision with glasses *now* 20/20 *each eye* uses glasses only for near vision
M D V 42 (astronomer)	Tires in reading after ½ hour is sleepy after 4 hours *work sleeps for* ½ hour then able to work again for next 4 hours	20/20 20/20	+0 25+0 25 ax 90 +0 25+0 50 ax 90	20+2/20 20+2/20	exop 2°	12° 16° exop no vol conv	Free of complaints
V R 22 (student)	Cannot concentrate on work has 8 different pairs of glasses decided to give up study of geography	20/20 20—1/50	—0 50—0 50 ax 180 —0 75—0 50 ax 180	20/20 20/20	exop 2°	20° exop, no vol conv	Hardly any complaints resumes study of geography
K L 22 (typist)	*Comes home exhausted* is unable to read or sew at night sleeps only in wee hours of morning uses prism 2 pr D base out at work	20/20 20/20	none		exop 6°	*18° exop,* no vol conv	*Free of complaints*
O W 16 (school boy)	Severe headache when wearing glasses especially cannot see sufficiently without	20/200 20/200	—2 —2 25	20/20 20/20	exop 2°	10° exop only slight vol conv	No complaints
M W 19 (medical student)	Is dissatisfied with and without glasses eyes burn headaches eyes water sometimes blurred vision has been using drops and ointment	20/20 20/20	+1 50 +1 50	20/20 20/20	exop 13°	12° exop only slight vol conv	No complaints
A H 32 (teacher)	Headaches, sometimes dizzy cannot visit *movies without getting* bloodshot eyes feeling of squinting at times	fingers/10 ft fingers/10 ft	—4 —4	20/20 20/20	*exop 2°*	10° exop no vol *conv*	No complaints except of dizziness *occasionally*

watching his eyes for nystagmoid movements Finally the patient is requested to walk backwards from one corner of the room to another with closed eyes, having first oriented himself well The patient suffering from Meniere's syndrome will fail to do this correctly"

Utermohlen now claims that these patients may lose all their complaints when given prisms, base in As the fundamental idea is to lessen the convergence, the base of the prism should always be in, whatever the heterophoria of the patient may be

For this purpose of lessening convergence Utermohlen uses weak prisms The maximum total value on both eyes never exceeds 3 prism diopters He starts with a prism of ½ prism diopter on each eye If the patient is not relieved of his complaints the amount is increased gradually, the stronger prism always being put before the eye on the s of weaker ear or the more

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R. T., 27 (housewife)	Headaches; dizzy; too tired to read at night, cannot concentrate	20/20 20/20	+.75 +.75	20/20 20/20	eso. 1°	13° exop., no vol. conv.	No complaints
N. T., 33 (teacher)	Headaches; has given up piano as career on account of impossibility of concentration on music; has had many glasses	20/20 20/20	+0.25+0.25 ax. 90 +0.25+0.37 ax. 90	20/20 20/20	exop. 4°	16° exop., no vol. conv.	No complaints, can play piano with comfort after day's work
M. A., 37 (engineer)	Headaches at irregular times, often on awaking; cannot concentrate on work when tired; eyes burn and get bloodshot	20/40 20/100	—0.50—0.25 ax. 180 —1.25—0.50 ax. 180	20/20 20/20	eso. 2°	15° exop., no vol. conv.	No complaints
O. L., 25 (lecturer)	Headaches; difficulty in reading with and without glasses for any length of time. "Having been reading for 20 min. without glasses it is a relief to put them on, but after another 20 min. in taking them off the eyes burn"	20/20 20/20	+1.25 +1.25	20/20 20/20	exop. 4°	16° exop., no vol. conv.	Doing splendidly
C. S., 19 (teacher)	Headaches; needs glasses but hates to wear them; wore glasses for 9 years	20/20 20/30	+0.50+0.50 ax. 60 +0.50+0.50 ax. 150	20/30 20/25	exop. 3°	10° exop., poor vol. conv.	Is now content with glass; vision 20/20 in each eye
O. M., 42 (clerk)	Is abnormally tired by his work to such an exrent that from 2-4 times daily he is obliged to take a short nap; is a clever person and good worker	20/200 20/200	—2—0.25 ax. 180 —2.25	20/20 20/20	exop. 2°	19° exop., poor vol. conv.	Feels much better; does not tire as quickly; still takes nap after supper
R. O., 28 (typist)	Headaches, equally on working days and holidays; wears glasses constantly	20/150 20/150	—1.50—0.50 ax. 45 —1.50—0.50 ax. 135	20/20 20/20	exop. 4°	13° exop., no vol. conv.	No headaches; wears glasses no longer, at home or office
H. B., 16 (schoolboy)	Headaches when reading over ½ hour; needs glasses for reading and wears them all day long	20—1/20 20/20	+1.50 +1.50	20/20 20/20	esop. 2°	10° exop., poor vol. conv.	No complaints; wears no glasses
M. A., 28 (nurse)	Poor vision, not perfectly corrected by glasses; easily tired when doing close work; eyes feel strained, burn, occasional headache	20/100 20/70	+4+1.25 ax. 25 +3.50+1.50 ax. 35	20/40 20+3/40	exop. 3°	9° exop., poor vol. conv.	Vision with glasses now 20/25 and 20/20 No more strain

Data on Treatment and Results (continued)

Patient	History	Vision Without Glasses	Corrective Glasses	Vision with Glasses	Maddox Rod at 20′	Maddox Wing & Vol Converg	Final Condition
P V, 26 (nurse)	Needs glasses constantly but wants to get rid of them, cannot do close work at night, easily tired, no headaches	$\frac{20}{40}$ $\frac{20}{10}$	+2 25+0 75 ax 40 +2 50+0 25 ax. 30	$\frac{20}{30}$ $\frac{20}{25}-3$	exop 2°	11° exop, poor vol conv.	Vision with glasses now $\frac{20}{20}$ each eye, uses glasses only for near vision
M D V, 42 (astronomer)	Tires in reading after ½ hour, is sleepy after 4 hours' work, sleeps for ½ hour, then able to work again for next 4 hours	$\frac{20}{20}$ $\frac{20}{20}$	+0 25+0 25 ax. 90 +0 25+0 50 ax 90	$\frac{20}{20}-2$ $\frac{20}{20}-2$	exop 2°	12°-16 exop, no vol conv.	Free of complaints
V R, 22 (student)	Cannot concentrate on work, has 8 different pairs of glasses, decided to give up study of geography	$\frac{20}{20}$ $\frac{20}{50}-1$	—0 50—0 50 ax 180 —0 75—0 50 ax 180	$\frac{20}{20}$ $\frac{20}{20}$	exop 2	20° exop, no vol. conv.	Hardly any complaints; resumes study of geography
K L 22 (typist)	Comes home exhausted, is unable to read or sew at night, sleeps only in wee hours of morning, uses prism 2 pr. D base out at work	$\frac{20}{20}$ $\frac{20}{20}$	none		exop 6°	18° exop, no vol conv.	Free of complaints
O W, 16 (schoolboy)	Severe headache when wearing glasses especially, cannot see sufficiently without	$\frac{20}{200}$ $\frac{20}{200}$	—2 —2 25	$\frac{20}{20}$ $\frac{20}{20}$	exop. 2°	10° exop, only slight vol. conv.	No complaints
M. W, 19 (medical student)	Is dissatisfied with and without glasses, eyes burn, headaches, eyes water, sometimes blurred vision, has been using drops and ointment	$\frac{20}{20}$ $\frac{20}{20}$	—1 50 +1 50	$\frac{20}{20}$ $\frac{20}{20}$	exop, 13°	12° exop, only slight vol conv.	No complaints
A H 32 (teacher)	Headaches, sometimes dizzy, cannot visit movies without getting bloodshot eyes, feeling of squinting at times	$\frac{\text{fingers}}{10\text{ ft}}$ $\frac{\text{fingers}}{10\text{ ft}}$	—4 —4	$\frac{20}{20}$ $\frac{20}{20}$	exop 2°	10° exop, no vol. conv.	No complaints except of dizziness occasionally

watching his eyes for nystagmoid movements. Finally the patient is requested to walk backwards from one corner of the room to another with closed eyes, having first oriented himself well. The patient suffering from Meniére's syndrome will fail to do this correctly."

Utermohlen now claims that these patients may lose all their complaints when given prisms, base in. As the fundamental idea is to lessen the convergence, the base of the prism should always be in, whatever the heterophoria of the patient may be.

For this purpose of lessening convergence Utermohlen uses weak prisms. The maximum total value on both eyes never exceeds 3 prism diopters. He starts with a prism of ½ prism diopter on each eye. If the patient is not relieved of his complaints the amount is increased gradually, the stronger prism always being put before the eye on the side of the weaker ear or the more irritable labyrinth. Testing patients by having them turn and walk backwards with closed eyes helps him to decide upon the weakest prism necessary to relieve the symptoms. As a rule these glasses should be worn permanently; sometimes it suffices to have them ready and put them on as soon as an attack of vertigo sets in. The whole procedure is entirely empiric.

I should like to report the following cases, in which I tried Utermöhlen's method:

Case 1.—A man 26 years old, after a motor accident, had normal eyes and ears but complained bitterly of dizziness when moving his head except when he did this very slowly. This condition had existed for a year and a half. He was sent to me by his family doctor, who asked me to try Utermöhlen's prisms. Immediate relief was obtained by prescribing for the right eye $+ 0{:}50 \times 80$ and for the left eye $+ 0.25 \times 100$, a prism of 1 diopter, base in, being added to each glass. Having been without complaints for about six months, the patient has accidentally discovered that he can omit wearing his glasses without difficulty. Only when he is tired, and especially after taking a drink, he notices his dizziness again. Prompt relief is obtained by putting on his glasses. After two years he developed the habit of always having them with him and putting them on only when necessary.

Case 2.—A man aged 62 was suffering from otosclerosis, mainly of the right ear. His right ear was deaf, and the right side showed stronger irritability of the labyrinth. He complained of dizziness while turning his head, had to grasp the wall or fence occasionally and felt uncertain when driving. He had heard of Utermöhlen's method and asked for prisms. His eyes were normal, showing only hyperopia of 1.50 diopters and exophoria of 4 degrees. Prescribing glasses of $+ 0.50$ and adding to the right glass a prism of 1.50 diopters and to the left a prism of 1.00 diopters relieved all his symptoms.

In discussing my patients, a striking fact to observe is that all 3 patients were referred to me for the special purpose of obtaining prisms; that is, to receive the benefit of Utermöhlen's treatment, of which they had heard such favorable reports. This of itself means a strong psychological impulse and could hardly fail to play an important role.

Recently I saw a woman patient aged 45 who was suffering from acute labyrinthitis. I told her about prism glasses, expressing the opinion that the effect was dubious but offering to prescribe them if she wished. Since she is a highly intelligent woman, I discussed the psychological angle with her. At first she had complete relief of her symptoms. She could move her head in all directions without becoming nauseated. The next day the glasses were of hardly any use. After three days I increased the strength of both prisms from 1 diopter to $1\frac{1}{2}$ diopters. Again prompt relief of her symptoms was achieved, but it lasted only about five hours, after which she took off the glasses. She made a very significant remark; that in the next two weeks she obtained temporary relief from dizziness by putting on the glasses, and as long as she felt the strength of the prisms the relief remained; but as soon as she was used to the prisms (which in the end took only about half an hour) the glasses were of no further help to her.

The psychological factor in Utermöhlen's treatment seems to me a most powerful one, and, as vertigo is often a manifestation of neurosis, it is bound to cure a number of patients.

It cannot, however, be denied that real ocular vertigo exists. This is "associated essentially with muscular anomalies, a circumstance not surprising in view of the close relationship between oculomotor and octavus systems" (Duke-Elder). It seems to me, however, that these cases represent exceptions.

I shall continue to try Utermöhlen's prisms in suitable cases, as I am interested in helping the patient, even though I fail to understand the working principles involved.[19]

SUMMARY

This presentation is divided into two principal sections, one dealing with convergence insufficiency and the other with convergence excess. The author describes his methods of treatment and the results

he has obtained, with emphasis on attention to the psychologic factor

RESUME

Cet article est divise en deux parties principales la premiere partie traite de l'insuffisance de la convergence tandis que l'autre traite de l'exces de la convergence L'auteur decrit sa methode et donne ses resultats en insistant sur le facteur psychologique

ZUSAMMENFASSUNG

Die Arbeit zerfaellt in zwei Hauptabschnitte Der eine beschaeftigt sich mit Stoerungen unzureichender Konvergenz der andere mit den [illegible] uebermaessiger [illegible] er beschreibt [illegible] ode und deren Ergebnisse und betont besonder die psychologichen Faktoren

RIASSUNTO

Questa presentazione e' divisa in due sezione principali, una che tratta di convergenza insufficiente e l'altra di convergenza eccessiva L'A descrive i suoi metodi di trattamento ed i risultati, con enfasi sul fattore psicologico

RESUMEN

Esta presentacion se divide en dos secciones, insuficiencia convergente y exceso convergente El autor describe sus metodos de tratamiento y los resultados, con enfasis sobre el factor psicologico

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Men are sometimes accused of pride, merely because their accusers would be proud themselves, if they were in their places

There is nothing more universally commended than a fine day, the reason is, that people can commend it without envy

I doubt whether it be not true, that we hate those faults most in others which we are guilty of ourselves —*William Shenstone*

Suprapubic Transvesical Prostatectomy with Primary Closure of the Bladder

Improved Technic and Latest Results

THEODOR HRYNTSCHAK, M.D., F.I.C.S.
VIENNA, AUSTRIA

THIS paper does not attempt a discussion of the different forms of prostatectomy for benign adenoma of the prostate, nor is it concerned with the pros and cons of perineal or retropubic methods as compared with transvesical methods. My purpose is to report the results obtained with my improved technic of transvesical enucleation with primary closure of the bladder.

No extensive report of the technic itself can be included here. A monograph describing and illustrating the method will soon be published.*

A historical survey of suprapubic transvesical prostatectomy reveals that until 1934 practically no lasting improvement had been achieved since the first attempt some sixty years ago. Even now the methods of choice call for no other attempt at hemostasis than to pack the prostatic cavity with gauze or to insert a bag catheter with, lately, the additional help of such hemostatics as gelfoam or oxycel.

All the old methods, such as hot irrigations, the use of concentrated solutions of silver nitrate or dextrose, protracted compression with a finger and intravenous or intramuscular injections of hemostatic agents, merely stressed, by their insufficiency, the necessity of suprapubic drainage.

Suprapubic drainage, however, has always been the main drawback of transvesical prostatectomy, for after withdrawal of the drain the remaining fistula requires a long time for healing, often involving infection and even necrosis of the abdominal fascia and fat tissue and greatly retarding final closure.

In several countries prostatectomy in two stages is still favored, but this entails an even longer period of convalescence and in many cases a third operation is required for final closure of the bladder.

It is small wonder, then, that Millin's operation has aroused general enthusiasm, seeing that it requires no opening of the bladder. However, even Millin's method has not solved the problem of complete hemostasis, nor does it exclude postoperative fistulas.

Why did none of us ever dare to suture the bladder immediately after enucleation? Usually all cavities opened in operative procedures are closed at once.

It was Harry Harris of Sydney, Australia, who first solved this problem. In 1934 he issued his first publication on suprapubic prostatectomy with complete hemostatis and primary closure of the bladder. In 1935 he favored me with a visit in Vienna and taught me his method. However, his original technic was so complicated that it required his own marvelous dexterity to master its difficulties. In the first years my results were unsatisfactory; I could not achieve more than an 85 per cent incidence of primary healing of the bladder without fistula.

On account of the difficulty of the original method, followers of the Harris technic were few and far between; a few surgeons—Düttmann, Guleke, Heyn, Kulenkampff and Wohlleben in Germany and Morson and Hey in England—adopted the

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Presented at a meeting of the Austrian Chapter, International College of Surgeons, Vienna, July 1, 1949.

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basic idea but developed technics of their own.

Since then fourteen years have gone by, during which I have constantly tried to improve and simplify the Harris method. Each phase has been submitted to continuous modifications and improvements, and I now think I have reached the goal of perfect hemostasis with primary closure of the bladder. The operation has become typical to its smallest detail, easy for any surgeon to learn and to perform. The only phase that requires some practice is the suturing with boomerang needles.

Except for the enucleation itself, the entire operation is performed under direct vision, each phase can be watched, including the suturing of the prostatic cavity.

After the operation the bladder is drained solely by an indwelling transurethral catheter.

Of the patients in my last 178 consecutive cases, 5 died, 1 of colisepsis and 4 of embolism.

In only 2 cases did a fistula develop. In 167 cases the bladder healed by primary intention; there was no suprapubic escape of urine in 148 cases.

The urethral catheter was removed:

In 50 cases after 1 day	148 cases	167
In 37 cases after 2 days		
In 34 cases after 3 days		
In 12 cases after 4 days		
In 15 cases after 5 days		
In 3 cases after 6 days	19 cases	
In 7 cases after 7 days		
In 9 cases between 8-14 day		
In 4 cases between 15-25 day		
In 2 fistulas		

Generally the patients get up twenty-four hours after the operation, rarely after forty-eight hours. One hundred and forty-eight of 173 urinated and walked about normally on the fifth day and wanted to go home. However, I generally keep them in the hospital until the eighth or the twelfth day, as many of my patients live far from Vienna.

Of the 178 patients, 47 had sterile and 131 infected urine before the operation. Whenever possible, preliminary preparation with an indwelling catheter was avoided.

22 patients were under 60 years of age
85 patients were from 60 to 70
70 patients were from 71 to 80
1 patient was 90 years old

I do not think that any other method of prostatectomy, whatever may be the mode of access to the prostate, can show equally quick and excellent results.

The aforementioned figures are small owing to the fact that my ultimate and most important improvement was achieved but a short time ago, and these figures include only the operations done after this last improvement. Since then, all results have been equally good, whereas previously 15 per cent or more of all patients had short-lasting suprapubic leakage and a convalescence period of over twelve days.

If in spite of these limited statistics I am publishing the results, it is because I believe that no further improvement of the technic can be achieved except one: prostatectomy should become an operation requiring no urethral drainage at all, except during the first twenty-four hours. This will be my next goal.

My method also proves that the earlier any organ is allowed to take up its natural physiologic function, the sooner recovery takes place; a consideration which, applied to surgery of the bladder in general, should open a vast field of new possibilities.

SUMMARY

The author announces a new technic for suprapubic prostatectomy with primary closure of the bladder. There were *no postoperative hemorrhages, no suprapubic leakage*, and only 2 fistulas in 178 cases; the urethral catheter in 148 cases was removed between the first and fifth day, allowing free voiding. In the author's opinion prostatectomy should become an operation requiring no urethral drainage beyond the twenty-four hours immediately following the intervention.

ZUSAMMENFASSUNG

Der Verfasser beschreibt eine neue Technik der suprapubischen Protataresektion mit primaerem Verschluss der Blase. Es traten keine Nachblutungen und keine suprapubischen Undichtigkeiten und nur zwei Fisteln in hundertachtundsiebzig Faellen auf; in hundertachtundvierzig vierzig Faellen wurde der Harnroehrenkatheter zwischen dem ersten und fuenften Tage entfernt und freies Urinieren gestattet. Der Verfasser ist der Meinung, dass die Prostataresektion ein Eingriff werden sollte, der keine Harnroehrendrainage fuer laenger als 24 Stunden nach dem Eingriff erfordert.

RESUMEN

Se describe una nueva técnica para prostatectomía suprapúbica con cierre primario de la vejiga. En 178 casos no hubo hemorragias postoperatorias ni derrame suprapúbico, solamente 2 fístulas; en 148 casos se retiró la sonda uretral entre el primero y el quinto día, permitiendo el vaciamiento libre. El autor opina que la prostatectomía llegará a ser una operación que no requiera canalización uretral a las 24 horas de la intervención.

RÉSUMÉ

L'auteur décrit une nouvelle technique de prostatectomie suspubienne avec fermeture immédiate de la vessie. Aucune hémorragie post-opératoire n'est rapportée, pas d'écoulement suspubien non plus, et seulement 2 fistules pour 178 cas. Dans 148 cas, le cathéter uréthral fut enlevé entre le premier et le 5e jour, permettant alors une miction libre. L'auteur est d'avis qu'une prostatectomie devrait se faire sans drainage uréthral après les premières 24 heures.

RIASSUNTO

L'A. descrive un nuovo tecnico per prostatectomia soprapubica con chiusuro primaria della vescica. Non occorreva emorragie postoperatorie, ne' colatura soprapubica, e solamente 2 fistole in 176 casi; il rimovimento uretrale in 148 casi fra il primo ed il quinto giorno, permettendo ad orinare francamente. Nell 'opinione del'A. prostatectomia dovrebbe divenire un'operazione che non ha bisogna del drenaggio uretrale oltre di ventiquattro ore immediatemente sequente l'intervento.

To Our Contributors Abroad

We regret to announce that under current publishing conditions it has become impossible for the *Journal* to arrange the translation into English of original articles submitted in other languages. With the single exception of articles written specifically for the *Seccion en Espanol,* which, of course, do not require translation, we must therefore request that all articles henceforward be submitted in the English language. Prompt publication can be greatly facilitated if all manuscripts are typed in double or triple space to allow room for editorial corrections. Your cooperation will be deeply appreciated.

Case Reports

Hemangioma of the Cervix Uteri

SAMUEL J. NIGRO, M D , F I C S , AND FRANCIS B TABAKA, M D , F I C S
CHICAGO

ANGIOMAS are commonly divided into two primary types,[1] the lymphangioma and the hemangioma. The lymphangioma is a proliferation of the cells lining the lymph vessels, forming colorless masses which may be designated, according to their appearance and site of growth, as simple or cavernous; the cystic hygroma also has been classified as a lymphangioma.[2] The hemangioma represents a similar type of proliferation of the endothelial cells of blood vessels, which may become canalized. This mass may establish contact with one or more other vessels, permitting a parallel flow. Ribbert[3] has stated that probably, as a rule, a hemangioma has no anastomoses with normal surrounding vessels except the one from which it originated, and that there are probably only one afferent and one efferent vessel connecting the whole hemangioma with its blood supply.

Hemangiomas are classified[4] by (*a*) means of appearance, (*b*) type of vessels contained in the mass, (*c*) location and (*d*) inheritability. The capillary hemangioma is composed of vessels resembling capillaries and occurs most commonly superficially to the skin. The cavernous hemangioma is composed of larger thin-walled spaces, or caverns similar to those found in spleen tissue; it occurs on the skin and in special organs, such as the liver, the ovary, or placenta or (rarely) bone. The angioblastic hemangioma is composed mostly of closed vessels and may be mistaken for hemangiosarcoma. The racemose hemangioma is a rare form, composed of a pulsating mass of dilated arterioles and capillaries. There are a few reports[5] of metastizing hemangiomas, all of which were benign in both the primary and the secondary lesions. The naevus vinosus is primarily a cutaneous type which resembles the cavernous hemangioma. The Rendu-Osler-Weber syndrome represents a telangiectatic lesion characterized by repeated hemorrhages, appearance in mucous tissue and familial occurrence.

A discussion of the treatment of angioma is outside the scope of this paper. The reader is referred to Winer's excellent review of this topic.[4a]

The first observation of angioma of the cervix uteri was reported by Machado in 1939.[6a] The patient had a history of chronic cervicitis; hemorrhage occurred at examination, biopsy and cauterization. An amputation of the cervix was performed, and the subsequent report of the pathologist gave a diagnosis of chronic cervicitis and collum angiomatosis. The second case, reported by the same author,[6b] also included a history of chronic cervicitis. In this case an incipient carcinoma of the collum was suspected; a total vaginal hysterectomy was performed; the patho-

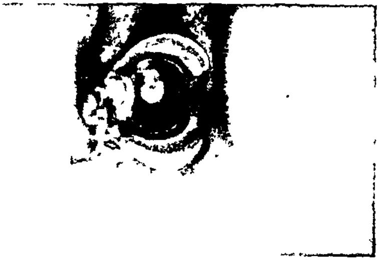

Fig. 1.—Gross app showing the

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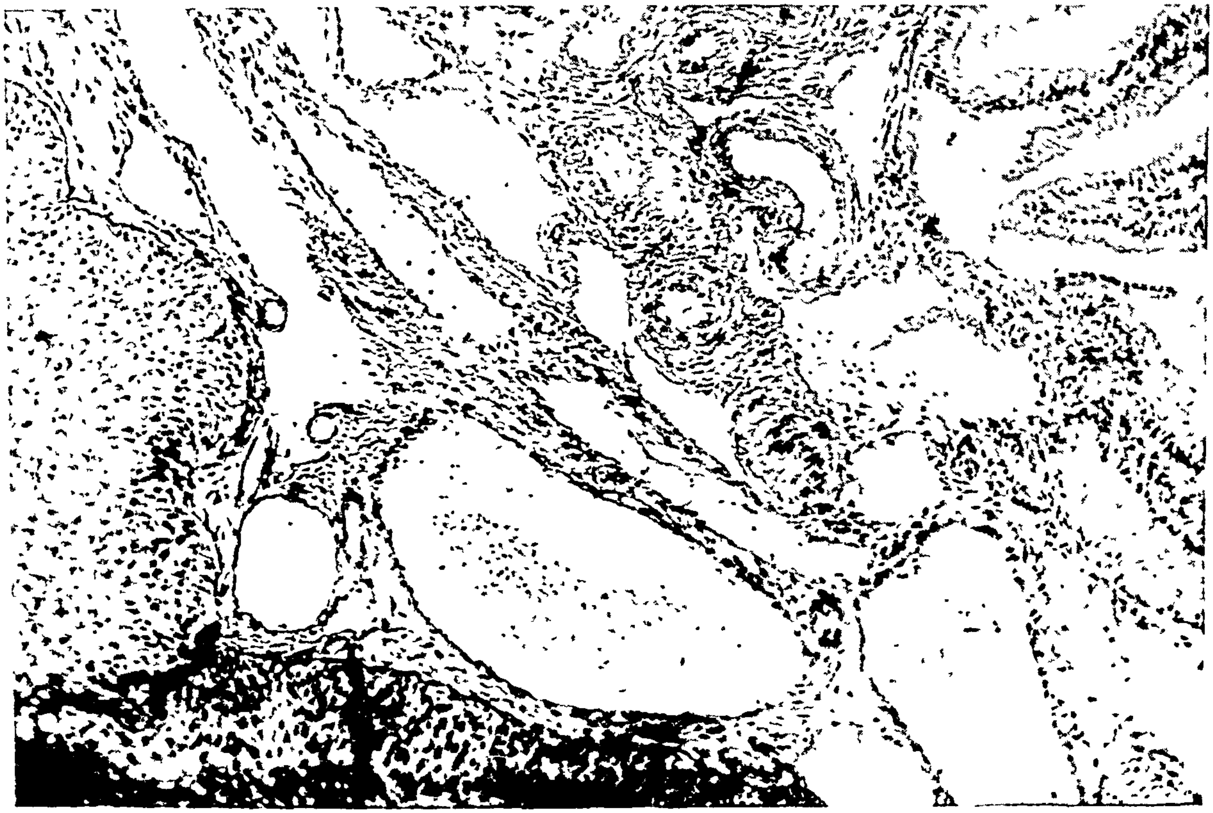

Fig 2 (above, opposite page) —Section of the cervix, showing intact mucous glands, and areas of proliferation Several blod vessels are seen in the center of the section

Fig 3 (below, opposite page) —Section of the cervix, showing larger areas of extravasated blood

logic report included the diagnosis of angioma of the cervix The details of these cases were reviewed by Machado in 1942[7a] and 1943.[7b]

It is now possible to add 1 more case to the literature Publication was delayed until a cure without metastases or recurrence could be definitely confirmed.

REPORT OF CASE

The patient, a 28-year-old white woman in her first pregnancy, was first seen on Nov 17, 1945, complaining of profuse vomiting The last menstrual period had begun on July 20 The only salient event in the past history was an appendectomy without complication in 1940 Physical examination disclosed a four-months pregnancy, the cervix appeared eroded, and a fatty papillomatose mass seen covering part of the cervix Conservative therapy was instituted until the patient was seen again one week later, at which time the cervix was cauterized. A routine examination on Jan 17, 1946, revealed no evidence of the growth, but on February 3 another papillomatose growth was seen (Fig 1), and a biopsy was performed

Microscopic Pathologic Report —There were marked proliferation and thickening, with areas of hyperkeratinization on the surface. The underlying mucous glands were intact (Fig 2), and some were filled with mucin, granulocytes and desquamated epithelial cells There were many areas of extravasated blood adjacent to the aforedescribed region (Fig 3) There was dilatation of the arteries and veins in a plexiform arrangement (Fig 4) The laboratory diagnosis was leukoplakia, hemangioma of the cervix, and hyperplasia of the cervical mucosa

On February 21 the tumor was cauterized, and on February 12 light cautery was used on the entire cervix Mucoid polyps in the

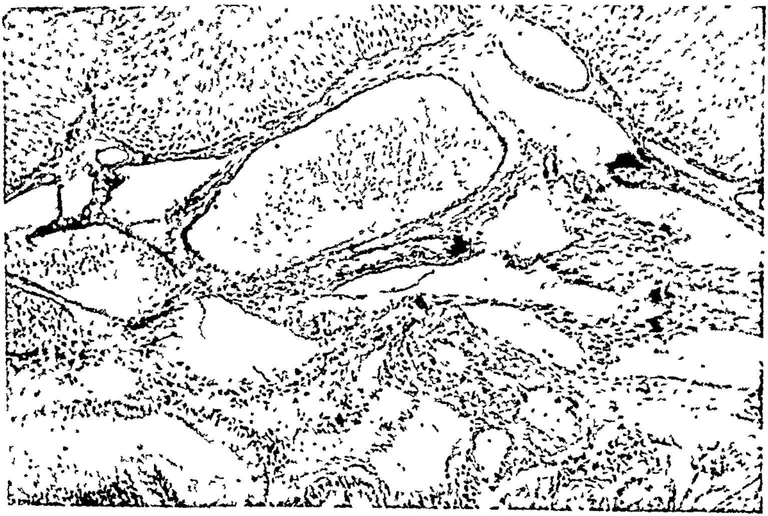

Fig 4 —Section of the cervix, showing vessels in plexiform arrangement Note especially the longitudinal sections of vessels near cross sections, the filled gland and the areas shown in Figure 3.

cervical introitus were cauterized on April 6. On May 1 a normal child weighing 7 pounds and 1 ounce (3.2 Kg.) was delivered, and a lateral tear in the cervix was repaired; the postpartum course was uneventful. On June 10 ergotrate was given for bleeding, but the cervix was essentially normal on examination (Fig. 4). The patient was not seen again until Feb. 15, 1949, when she complained of painful coitus, vaginal discharge, and clotting during the menstrual flow; the cervix again showed erosion, but other conditions were within normal limits. The patient was seen again on Dec. 9, 1950, when the field appeared normal.

Machado[8] has postulated that the angiomatic formation is a special form of tissue reaction to chronic inflammation. From this case and those reported by him, this seems to be a reasonable postulate, since in all cases chronic cervicitis was present. One suggestion should be added to this, however, and that is the possibility of an individual predisposition to this type of reaction, probably in the same manner that individual predispositions are found to other types of tumor development. The strongest evidence for this in the case of the type discussed above is the appearance of the familial characteristic of the Rendu-Osler-Weber syndrome. In the case presented here it was impossible to determine any familial history; Machado did not mention this.

This case is similar to the others reported except that the hemangioma was first seen during pregnancy and recurred after initial treatment. The treatment was conservative in order to eliminate possible fetal injury. Chronic cervicitis was the outstanding concurrent symptom; this suggested the possibility of carcinoma, especially when the mass was seen to recur.

RÉSUMÉ

D'aprés une discussion assez brève du sujet, un cas d'hémangiome du cervix uterim est décrit en détails. Il est suggéré que les conditos inflammatoires chroniques entraînment une reàction tissulaire qui predispose a la formation hemangiome.

ZUSAMMENFASSUNG

Nach einer kurzen Eroerterung frueherer Arbeiten wird ein Fall von Haemangiom des Gebaermutterhalses im einzelnen beschrieben. Es wird angenommen, dass chronisch entzuendliche Prozesse eine Gewebsreaktion hervorrufen, die eine Praedisposition zur Entstehung eines Haemangioms schafft.

RIASSUNTO

Dopo una breve discussione del lavoro precedente, un caso di emangioma del collo del utero e' descritto in particolarita'. E' suggerito che processi inflammatorii cronici conduccono una reazione al tessuto che predispone la formazione di emangioma.

RESUMEN

Los autores dan cuenta de un caso de hemangioma del útero cervical en una mujer de la edad de veintiocho anôs. La lesion fué reconocida en primer lugar durante la preñez. Volvió a ocurrir después del tratamiento inicial. Este fué conservador para precaver daño al feto. El síntoma saliente fué una cervicitis crónica, sugeriendo que el tumor fué maligno.

Author's Note: Grateful acknowledgement is made to Drs. E. Nora and H. O. Maryan of the staff of Columbus Hospital, Chicago, for their assistance in the preparation of this work.

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8. Machado and Junqueira.[6] Machado.[7]

Malignant Synovioma of the Hand

K. L. McSHANE, M.D, F.I.C S.
CHEYENNE, WYOMING

MALIGNANT synovioma is a rare, highly specialized form of neoplasm occurring in the extremities. Cases have been reported with increasing frequency since its identification by Lewis in 1927. They are often classified as bone tumors of nonosseous origin. Meyerding includes synovioma in the fibrosarcoma group of tumors. Because of its rare occurrence and the relatively poor results following treatment, Haagensen and Stout in 1944 reviewed 95 cases previously reported and added 9 cases of their own. Of the 104 cases reviewed, they reported only 3 in which there was five-year survival. In 1947 Bennett reported a study of 32 specimens registered at the Army Institute of Pathology during the war period 1941-1945. Follow-up studies were not completed, but 16 patients were known to have died or had local recurrences or metastases, which again points to the seriousness of the disease. The incidence was 3 male to every 2 female patients, and the average age was 32 years. In only 2 cases did the tumor actually involve the synovial membrane, whereas giant cell tumors, hemangioma, hyperplasias and other benign lesions almost always primarily involve the synovial membrane.

Bennett also noted frequent local recurrence following excision and the high incidence of pulmonary metastases without regional gland metastases, which suggests the blood stream as a frequent route of metastasis. The distribution of the lesions in the 104 cases was 79 per cent in the lower extremity and 21 per cent in the upper extremity. The first symptom was pain. Approximately half the tumors were located near the knee joint, though they have been reported as occurring in the region of every joint in the extremities.

The gross pathologic picture shows the tumors to be firm and nodular, with a tendency to infiltrate. They occur close to a joint, tendon sheath or bursa, but rarely do they project into the synovial cavity. On section the tumor is pale and mottled from hemorrhage or degeneration. Its consistency may also vary with the presence or absence of calcification.

The histopathologic picture is characterized by two distinct and associated elements: the fibrosarcoma elements and the synovial elements.

The therapy employed in the cases reviewed by Haagensen and Stout was of four general types:

1. Irradiation alone or combined with surgical intervention. There is no evidence that irradiation has even palliative value.

2. Local excision. This is the usual treatment, or rather the tumor is roughly shelled out by blunt dissection. The procedure is often repeated for local recurrence as frequently as two, three and in 1 instance four times.

3. Excision or exploratory attempt at excision followed by later amputation. This type of therapy also proved unfortunate, as the decision to amputate was usually reached after a mutilating and traumatic attempt at excision had been made, which

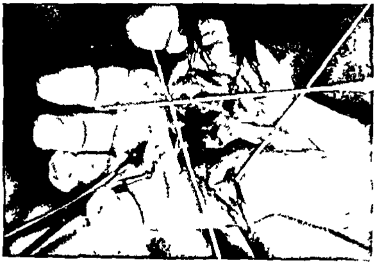

Fig. 1.—Malignant synovioma of the hand.

Submitted for publication Nov 27, 1950.

ground and its treatment An illustrative case is reported

RESUME

L'auteur étudie les statistiques des tumeurs malignes de la synovie, son terrain histologique, son traitement Un cas est offert a l'appui

ZUSAMMENFASSUNG

Der Verfasser eroertert die ueber boesartige Synoviome vorliegenden Statistiken und die pathologischen Hintergruende sowie die Behandlung der Erkrankung Ein erlaeuternder Fall wird mitgeteilt

RIASSUNTO

L'A discute le statistiche su sinovioma maligna, fondo patalogico ed il trattmento Rapporta un caso esplicativo

RESUMEN

Se discute la estadistica sobre sinovioma maligno, su cuadro patologico y su tratamiento Se comunica un caso ilustrativo

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Science has shown the great circles in which nature works, the manner in which marine plants balance the marine animals, as the land plants supply the oxygen which the animals consume, and the animals the carbon which the plants absorb These activities are incessant Nature works on a method of *all for each and each for all* The strain that is made on one point bears on every arch and foundation of the structure There is a perfect solidarity You cannot detach an atom from its holdings, or strip off from it the electricity, gravitation, chemic affinity, or the relation to light and heat, and leave the atom bare No, it brings with it its universal ties —*Emerson*

Editorial

Hepatic Anoxia and Postoperative Shock

The important role of the liver in surgery was emphasized in 1941. In that year a classic text on the subject was published by Boyce,[1] containing all the available information on the hepatic aspect of surgical physiology. In spite of this excellent monograph, the published literature since 1941 contains only infrequent additional contributions to the role of the liver in surgery. The clinical surgeon is still groping in the dark, vainly attempting to find the answer to several problems connected with postoperative complications. An initial step toward the solution of many of these problems may be taken by studying hepatic physiology.

My personal interest in hepatic function was expressed in a previous publication.[2] Based on the revelations afforded by that study, additional valuable data on postoperative shock have been revealed. During the postoperative period many persons were observed to go into periods of shock that responded to shock therapy, and soon another episode of transitory shock supervened. Most often these patients had undergone long operative procedures under general anesthesia.

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authors present the results of their own study as well as a review of the work of others. None of these investigators, however, has postulated the deleterious effect of anoxia on the liver and its association with shock phenomena. McIver and Winter proved experimentally that anoxia seriously disturbs hepatic physiology and produces demonstrable pathologic changes.[4]

Supported with this information, I am prepared to discuss my own postulation of the relation between hepatic anoxia and postoperative shock. The onset of anoxia may occur postoperatively from many causes, according to the underlying type of anoxia produced. In a patient to whom a general anesthetic is administered, incipient anoxic anoxia is always present because of the use of the inhalant. Pulmonary obstruction during or after operation further increases the tendency to anoxic anoxia. This may result from tracheal obstruction due to a plug of mucus occluding a bronchus, as in massive collapse. The development of postoperative pneumonic consolidation, either localized or diffuse, is another etiologic factor.

Anemic or ischemic anoxia occurs in
persons preexisting vascular dis-
turbance hronic hemorrhage. In this
situation is a decreased amount of
function oglobin in the blood. Stag-
nant a more frequently en-
counter rly patients with cardiac
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failure may be general
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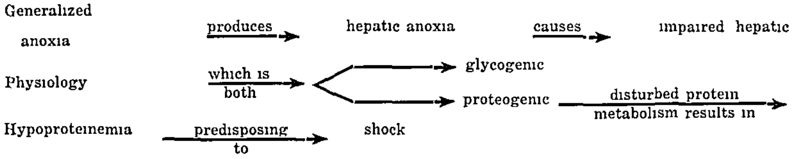
of the liver results.



This state further impairs physiologic function of the liver Any of the afore mentioned factors producing anoxia necessarily results in hepatic anoxia Although the liver has an enormous reserve capacity and it is not easily impaired, anoxia rapidly produces pathologic hepatic changes This state of anoxia added to a preexisting abnormal condition in the liver, such as chronic passive congestion, further disturbs normal hepatic function Under these conditions the anoxic damage consumes the hepatic protein elements and the stored glycogen These debilitating factors leave a cadaveric organ, depleted of all its reserve capacity The proteogenic function of the liver thus disturbed is conducive and results in hypoproteinemia It is known that hypoproteinemia is one of the most potent physiochemical factors predisposing to shock[6] Depending, therefore, on the amount of hepatic damage, the patient will or will not go into postoperative shock Transitory shock occurs when the protein level falls to a critical point beyond which the physiochemical harmony collapses Correction of the anoxia and the protein level restores the physiochemical harmony, and shock disappears until the physiochemical discord again occurs Diagramatically it may be illustrated as above

In my opinion, the presence of anoxia in the surgical patient is a major contributing cause of postoperative shock Correction of the anoxia by prevention or elimination of the causes that may produce anoxia is one of the most beneficial prophylactic measures

—*Bernard J Ficarra, M D, F I C S**

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*Professor of Research Biology St John s University

Correction

In the January issue of the *Journal*, the title of Dr Gilbert F Douglas, Jr was given erroneously as Assistant Professor, Department of Medicine, Medical College of Alabama The title should read as follows "Instructor, Department of Medicine, Medical College of Alabama"

New Horizons

By the Editor

The Conquest of Fear

The recent appearance of sundry stories and articles in the popular press marks the beginning, it is to be hoped, of a new epoch of intelligence with regard to one of mankind's most implacable enemies, the malignant neoplasm. Though most of these are strictly factual, they are written with the style and pace of fiction and should therefore do much to stimulate a new kind of interest in the problem. There has been drama enough, Heaven knows, on the negative side; the dread word "cancer" has seldom been pronounced without a shudder. Human nature being what it is, there is a strong possibility that, if men and women can be brought to see the drama that lies in fortitude and a gallant fight toward facing the facts as they are, the psychic conflicts of the victim of carcinoma will be considerably lessened.

It is therefore fortunate that nearly every such story is concerned chiefly with the psychic aspects of the matter. The shock of diagnosis, the panic terror of the next few days, the grim acceptance, the staggering sense of frustration and despair, the suspense, the discomforts of treatment, the erosion of the ego, the resentment not only of the disease itself but of the pity and compassion of friends and family, the agonizing remorse so well known to everyone who has ever "taken out" his own suffering on his loved ones—all are freely and frankly confessed and described, with an intimacy of detail both painful and illuminating. Quite as freely and frankly the sufferer's ultimate victory is recounted, together with the sure inner sense of emotional and spiritual enlargement that invariably accompanies triumph over self and self-interest in any form.

In a number of cases treatment was successful, and the author was spared the ultimate test of courage that many must face—the knowledge that nothing permanently helpful can be done. Facing the possibility of death from carcinoma is one thing; facing the certainty of it is another. Yet any surgeon is well aware, from an occasional rare and deeply inspiring experience, that this challenge too can be met, and not only gallantly but graciously, even with a suggestion of the cavalier, up to the very end. It is when one encounters such an example of the superb heights to which humanity can arise that one is confirmed in one's instinctive knowledge that heroism is more than a word and personal dignity more than a romantic figment. Man is often ridiculous on the surface, but essential humanity has no acquaintance with the word.

Immeasurably the most valuable conclusion to be drawn by any reader from narratives of this kind is the knowledge that, however it looks at first glimpse, *there are worse things than cancer.* Nobody, least of all a surgeon, has any desire to deny the very genuine tragedy involved, or to belittle the patient's suffering. But every surgeon's and every patient's load would be greatly lightened if men and women everywhere could be infused with a realization of their own great powers of self-discipline and control. This capacity varies, of course, in different persons, but it is not too much to claim for it an existence and a strength far more nearly universal than is commonly supposed.

The psychic element looms large in the therapy of malignant disease. Its dangers have been lessened in recent years by abandonment of the sufficiently asinine idea that there is something shameful about having "cancer"; even leprosy today is losing that stigma Education toward an intelligent outlook has done much and will do more But in the last analysis there is only one thing that can complete the conquest of fear, and that is the growth of the individual soul Through pain and suffering men become supermen, or they sink forever below the human level To a far greater extent than most believe, this is a matter of choice

Voluntary Protection Program

The new Program for Voluntary Protection of Technical Information, a service recently provided by the U S Department of Commerce, will meet an urgent though largely unrealized need, and should also serve to awaken the general public to its responsibilities in this direction The indiscreet and injudicious spreading of technical and scientific data, whether by word of mouth or through the medium of print, can be exceedingly dangerous in times of crisis like the present

The new service, the Department announces, "will receive requests for advice as to whether specific technical data should be disclosed, withheld, or given limited distribution The Office of Technical Services will obtain expert opinions from the interested departments and agencies of the Government and will inform the inquirer accordingly" It is pointed out that there is absolutely no compulsion involved, the extent to which *the service is utilized will depend entirely* on the sense of individual responsibility of those who hold responsible positions in any area of communication

It should be emphasized strongly that this program "is not primarily concerned with information already classified as restricted, secret, confidential or 'top secret' by the United States Government," since information of this kind is closely guarded as a matter of course What is needed is some reliable check on the information not so classified but carrying a potentiality of harm if broadcast unwisely, advanced industrial developments, strategic equipment, special installations, production "know-how" and technology and, in the field of science, the results of certain types of research—these are the matters with which the new service is concerned

With regard to scientific and technical journals, the Secretary's announcement reads as follows

"It is not contemplated that persons in a position to release unclassified technical information will normally call on the Office of Technical Services for guidance regarding release to known representatives of recognized scientific and technical journals, radio networks, press associations and newspapers Most of these organizations have wide experience in safeguarding such material However, the service will be available to both the editor and the source of the material if they desire to use it"

The *Journal of the International College of Surgeons*, like numerous other responsible scientific publications, has long since anticipated the program so far as its own activities are concerned As the Secretary's announcement makes clear, release of information to the United States is *tantamount to publication throughout* the world When this is taken into consideration it becomes obvious that at all times, and particularly in times of crisis and emergency, the utmost care must be taken before any facts, however valuable in themselves, are made public property What is useful to us will be equally useful to any potential enemy of our way of life

This *Journal*, therefore, accedes not only willingly but with relief and pleasure to this official request that the establishment of the new Protection Service be given the widest possible publicity and support Requests for advice concerning release of information, whether by individual workers or by organized groups, should be addressed to the Office of Technical Services, U S Department of Commerce, Washington 25, D C

Chapter News

International College of Surgeons

United States Chapter

Arnold S. Jackson, M.D., F.A.C.S., F.I.C.S., Secretary

Plastic Surgery Section Formed: A group of prominent plastic surgeons are now actively engaged in forming a Section on Plastic Surgery. This promises to be one of the most interesting and rewarding of the many Chapter activities. Preliminary meetings are being held among officers of the College to examine the potentialities and implement the plan.

Assembly Date Extended: The program for the forthcoming Chicago Assembly in September has been extended by one day. The dates are now September 10 to 14 inclusive. The extra day will be devoted to presentation of papers by the two new Sections, Plastic Surgery and Occupational Surgery.

Exhibit Space: Those who wish to present scientific exhibits at the forthcoming Chicago Assembly are requested to send in their applications at once. The closing date for receipt of these is May 1. Inquiries should be addressed to H. R. Heberlein, Director of Scientific Exhibits, Jackson Clinic, 16 South Henry Street, Madison, Wisconsin. Details and official application blank will be found on pages XIV and XV of this issue.

Museum: An Alexis Carrel museum in the College Home is contemplated. The moving spirit in this interesting project is Dr. Ralph E. Scovel, F.I.C.S., of San Francisco. Many interesting exhibits, manuscripts, etc., connected with the world-famous artificial heart experiment will be presented as a permanent contribution to scientific and surgical archives.

New York Surgical Section: Dr. Horace Ayres, Regent of the United States Chapter for the State of New York, is a man of action. He is reorganizing state activities on a large scale. The First Annual Dinner of the New York State Surgical Section was held on March 14, with Dr. Henry Kessler, F.A.C.S., F.I.C.S., as toastmaster. Speakers of the evening, in addition to Dr. Ayres, were Dr. Herbert Acuff, President of the International College of Surgeons; Dr. Henry W. Meyerding, President of the United States Chapter, and Dr. Max Thorek, Founder of the College. The meeting was a most enthusiastic one. An open discussion of many problems resulted in clarification of several important issues.

Journey to Florence: A large group of members and officers of the United States Chapter have already made travel reservations to attend the Third Annual Assembly of the Italian Chapter in Florence, which will take place on May 4 and 5 of this year. Among them are Dr. Herbert Acuff, President of the International College of Surgeons; Dr. Arnold S. Jackson, Secretary of the United States Chapter, and Dr. Max Thorek, Founder and Secretary General of the International College of Surgeons. It is confidently expected that the already large number of bookings will be substantially increased within the next few weeks, for the meeting promises to be an occasion well worth remembering. A formal announcement, with directions for obtaining details of travel and arrangement, appears elsewhere in this issue.

Dr. Strauss Honored: Dr. Alfred A. Strauss, F.I.C.S., senior attending surgeon at Michael Reese and Mt. Sinai Hospitals, Chicago, has been awarded the highest tribute available to an alumnus of the University of Washington at Seattle, having been cited as Alumnus Summa Laude Dignatus for 1951. He will receive an honorary scroll at Commencement in June.

Dr. Strauss interned at Michael Reese and has specialized in surgery of the colon and stomach. He has sponsored a Strauss Foundation lectureship at the medical school of the University of Washington, in the establishment of which he took an active part. He is also Founder of the Franklin Boulevard Hospital in Chicago.

Addendum: Because of a printer's error, the name of Dr. D. P. Hall of Louisville, Kentucky, was omitted from last month's report of the meeting of the Southern Surgical Section in Atlanta. Dr. Hall presented a very fine paper entitled "Recurrent Inguinal Hernia."

Finnish Chapter: At the Annual Meeting of the Finish Chapter, held in Helsinki on Jan. 26, 1951, Prof. Dr. Kalle Emil Kallio, Professor of Surgery, University of Helsinki, *was elected President. Prof. Kallio was formerly* Surgeon-in-Chief of the Hospital of *Enso and has been Assistant Chief of the* Orthopedic Hospital of the Invalid Foundation of Helsinki since 1942. He has many contributions to surgical literature to his credit and is a member of the Finnish Society of Surgeons, the Nordic Society of Surgeons, Association Francaise de Chirurgie, and the International Society of Orthopedic Surgeons. He has been a member of the National Committee of the International Society of Orthopedic and Traumatologic Surgery.

The following officers, all of Helsinki, were also elected:

Vice-President	Prof. Dr. Äinö Seiro
Secretary	Dr. Atso T. Soivio
Treasurer	Docent Dr. Tauno I. Putkonen

Before the presentation of scientific papers, Prof. Dr. Atso T. Soivio, representative of the Finish Chapter to the International Assembly in Buenos Aires, gave an account of that meeting and the activities of the College.

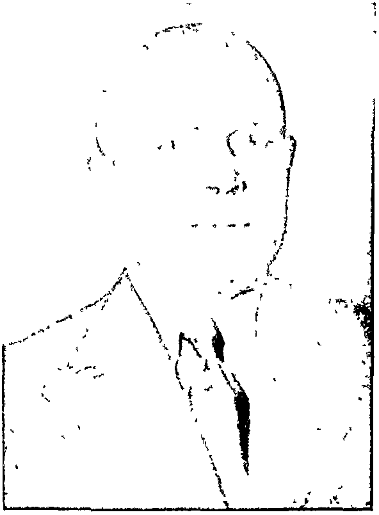
Haitian Chapter: At the recent First Assembly of the Haitian Chapter of the International College of Surgeons, the following representative papers were presented:

Interilioabdominal Disarticulation, by Dr. A. Miot, F.I.C.S.

Surgical Treatment of Chronic Lymphangitis of the Lower Extremity, by Dr. Constant Pierre-Louis, F.L.C.S.

Ureteroenteroanastomosis, by *Dr.* Antony Lévêque, F.I.C.S.

Dr. Miot's paper emphasized his conviction that in the presence of malignant tumor of the lower extremity amputations and disarticulations should be performed as remotely as possible from the tumor site. He recommended an interilioabdominal procedure which, he pointed out, has been used *successfully in* several countries, not only for malignant tumor but for osteomyelitis, tuberculous or nontuberculous. Preoperatively the large intestine is thoroughly evacuated, the urinary bladder catheterized and the blood group determined. The operative technic is divided into three stages: (1) anterior, (2) perineal and (3) posterior.



Dr. K. E. Kallio.

1. Incision is made from the symphysis pubic, *extending upward slightly above* Poupart's ligament to the anterior superior iliac spine. The abdominal muscles and the inguinal ligament are detached and the iliac fossa is opened between the peritoneum and the iliac bone. The urinary bladder is carefully *drawn aside.*

2. The limb is now forcibly abducted. An incision is made along the lower border of the pubic bone extending as far as the tuber ischio. The ischiocavernosus, the transversus perinei and the periosteum are detached. With an osteotome, the pubic symphysis is sectioned.

3. The anterior incision is extended from the anterior superior iliac spine to the posterior superior iliac spine, from there coursing along the gluteal fold to the perineal incision. The sciatic nerve is cut. The iliac bone is sawed and the sacroiliac ligaments divided. The wound is then closed. Penicillin and liquid diet are prescribed as needed.

Possible postoperative complications are shock, vesical paresis, relaxation of the sphincter ani. These can be successfully controlled.

The paper by Dr. Lévêque on ureter transplantation opened with a discussion of recent advances and modifications in technic, pointing out that sulfonamides and antibiotics have materially reduced mortality and morbidity rates. The ureters have been successfully implanted in the urinary bladder, in the cecum and in the sigmoid. Not uncommonly the operation has been performed after hysterectomies in which one or both ureters have been accidentally divided. The ureters may also be injured in the course of a difficult labor. Other indications are malignant tumor of the bladder, ureterovesical fistula and vesical extrophy. More than fifty different technics for ureteral transplantation have been presented.

Newer surgical technics were also stressed by Dr. Pierre-Louis in his discussion of chronic lymphangitis of the lower extremity. The theory that this condition is always due to filaria has been discredited. Infection is the principal etiologic factor, but it may be either streptococcic or staphylococcic. Stasis due to the upright posture, interfering with the circulation, may also contribute. The postoperative wearing of an elastic stocking or an elastic bandage, the avoidance of the standing posture and the administration of bebrolysin are recommended.

German Chapter: The German Chapter of the International College of Surgeons will hold its Second Assembly on March 28, 1951, at the Park Hotel, Hamburg, Germany. All members of the College and other interested surgeons are cordially invited to attend.

The meeting will begin at 6 p.m., with the following order of business:

1. Call to order by the President, Prof. Dr. G. E. Konjetzny, Professor Emeritus of Surgery, University of Hamburg
2. Roll call
3. Reading of the Minutes of the meeting held on February 6, 1950
4. Presentation of new members
5. Announcement that the following members of the German Chapter have been elected to the International Board of Trustees by the International House of Delegates:

   Prof. Dr. G. E. Konjetzny, Hamburg
   Prof. Dr. Arthur Hübner, Berlin
   Prof. Dr. Albert Lezius, Hamburg
6. Adjournment

After the business session there will be a Banquet at the Park Hotel for all members, their wives and guests.

Appointment: Prof. Dr. R. Zenker, of Mannheim, has accepted the position of Professor of Surgery and Director of the Surgical Clinic at the University of Marburg.

Turkish Chapter: The Turkish Chapter, under the leadership of Prof. Dr. Burhaneddin Toker, President, and Prof. Dr. Dervis Manizade, Secretary, held the first of the four scientific meetings planned for 1951 at the Cerrahpasa Hospital, Istanbul, Jan. 27, 1951. Owing to the illness of the President, Prof. Burhaneddin Toker, the Vice-President of the Chapter, Dr. Feridun S. Evrensel, presided.

Prof. Manizade spoke briefly on the importance of the International College of Surgeons and its international activities. Dr. Feyyaz Berkay, who has recently returned to Turkey after postgraduate studies in the United States, spoke on the activities of the United States Chapter.

The following scientific papers were presented:

1. *Mesenteric Thrombosis Following Splenectomy*, by Prof. Dr. Fahri Arel.
2. *Case Report of Calcified Hydatid Cyst of the Liver Causing Symtoms of Stenosis of the Pylorus*, by Prof. Feridun Sevket Evrensel.
3. *A New Method of Radical Sympathectomy for Vascular and Trophic Diseases of the Lower Extremities*, by Dr. Feyyaz Berkay.
4. *Case Report of Frontal Sinusitis of the Hyperplastic Type Causing Exophthalmos*, by Dr. Ziyaettin Maktav.
5. *Case Report of Phytobezoar Weighing 1,150 Grams Associated with a Large Callous Ulcer of the Lesser Curvature of the Stomach*, by Prof. Dervis Manizade.
6. *Resection and Plastic Operation on the Mandible for Large Adamantinoma*, by Prof. Derviş Manizade.
7. *Case Report of Removal of Broken Knife Blade Situated Intradurally After Penetrating Vetebral Canal Three Months Prior to Operation*, by Prof. Derviş Manizade.

The next meeting of the Turkish Chapter will be held in Istanbul in April.

General News Notes

International Health Exhibition and International Medical-Surgical Meetings: An International health exhibition, with international medical-surgical meetings devoted to every specialty, will be held in Turin, Italy, every two years The first meeting will take place in the Exhibition Building in Valentino Park, Turin, between May 30 and June 12, 1951

These events are the work of the Minerva Medica journalistic group and are under the chairmanship of Prof A M Dogliotti, Director of the Turin Surgical Clinic

The First International Health Exhibition will comprise the following sections

1 Synthesis of Social Health Assistance
2 Hospital Organization
3 Hospital Equipment
4 Pharmaceutical Products
5 Mother and Child
6 Medicine and Industry
7 Rehabilitation and Reeducation of the Disabled
8 Hygiene and Sport
9 Teaching and Dissemination
10 Civil and Military Defense of the Public Health

According to special communiques, the meetings in the following specialties are anticipated General Medicine, General Surgery, Gynecology and Obstetrics, Pediatrics, Neuropsychiatry, Otorinolaryngology, Ophthalmology, Urology, Orthopedics and Traumatics, Neurosurgery, Angiocardiosurgery, Plastic Surgery, Stomatology, Roentgenology, Anesthesia, Hydrology, Phthisiology, Cancerology, Rheumatology, Blood Transfusion, Aerosol Therapy, Social Medicine, Industrial Medicine, Medicine of Sports, Sterility and Artificial Fecundation, Hospital Technic and Hygiene, Medical Statistics, and History of Medicine

Distinguished representatives of the various specialties will be invited to attend these meetings and lecture on important subjects

At the same time, during the fourteen days the Exhibition is open, the following national and international congresses and regional conventions will be held in Turin

Second Congress of the Italian Society of Thorax Surgeons

Third Congress of the Italian Society of Anesthesia

Sixth Congress of the Italian Society of Nepiology

Twenty-fourth Congress of the Italian Society of Urology

Fourth National Congress of Blood Transfusion

First Congress of the Italian Society of Aerosol Therapy

Second Congress of the Italian Society of Pathology

International Convention of Aeronautic Medicine

Convention of Naval Medicine

Franco-Italian Convention of Dermatology

Twenty-fifth National Congress of Doctors

Seventh National Congress of Doctors of Hygiene

Convention of Stomatology

International Meeting of Manufacturers of Pharmaceutical Products

International Meeting of Manufacturers of Surgical-Medical Machinery

International Meeting of Medical Reviews

Organization of the following artistic displays is anticipated

1 International exhibition by medical artists

2 Display of posters propagandizing the health industries

3 International display on the theme "Advertising, Propaganda and Packaging of Pharmaceutical Products"

4 Competitive display open to amateurs of any part of the world for the best photographs on the subject of medicine or surgery

5 Philatelic exhibition in connection with health

The following competitions will also be held

1 Competition open to doctors who are cinema amateurs for films on various themes

2 Competition open to all journalists visiting the Exhibition for the best article on the event itself

At the Teatro Nuovo and other Turin theatres, exceptionally important and interesting events will be organized, among them being a concert by I Dobrowen offered by the Italian Radio, plays by J Barrault, a concert by the Orchestra of the Teatro Nuovo with the pianist Arturo Michelangeli, modern operatic works (Dukas) and Italian eighteenth-century opera (Pergolesi) A detailed program will be issued in good time

Those desiring further information should apply to the General Secretary, Prof. S. Teneff, Palazzo delle Esposizioni al Valentino, Turin, Italy.

Kessler Institute Holds Fifth Annual Amputee Conference: The Kessler Institute for Rehabilitation of West Orange, New Jersey, will hold its Fifth Annual Amputee Conference on April 5, 6 and 7, 1951. The following program will be presented:

Thursday, April 5	*Upper Extremity*
9:00- 9:15 a.m.	Registration
9:15-10:15 "	Introduction to Amputee Problem
10:15-10:45 "	Basic Surgery—Upper Extremity
11:00-12:00 "	Mechanical Prosthesis
12:00- 1:00 p.m.	Luncheon
1:00- 1:30 "	Cineplasty and Cineplastic Prosthesis
1:30- 1:45 "	Preprosthetic Training — Upper Extremity Amputee Film
2:00- 3:00 "	Training Technics
3:00- 4:30 "	Clinic—Arm Amputees
Friday, April 6	*Lower Extremity*
9:00-10:00 a.m.	Basic Surgery of A.K.
10:00-10:30 "	Anatomy of Lower Extremity
10:45-11:00 "	Fundamentals of Locomotion
11:00-12:00 "	Preprosthetic Care—Bandaging—Bed Posture
12:00- 1:00 p.m.	Luncheon
1:00- 2:15 "	Prosthesis — Selection and Fit of Conventional A.K. Prosthesis
2:30- 3:45 "	Training Principles and Crutch Walking
4:00- 4:30 "	Discussion of Surgical and Prosthetic Aspects or Clinic—Lower Extremity
Saturday, April 7	*Lower Extremity*
9:00- 9:45 a.m.	Basic Surgery B.K.
9:45-10:15 "	Conventional B.K. Prosthesis
11:00-12:30 p.m.	Suction Socket Prosthesis
12:30- 1.30 "	Luncheon
1:30- 2:00 "	Tilting Table
2:00- 3:00 "	Demonstration of Training Technics A.K. and B.K. Amputees
3:15- 4:00 "	Round Table Discussion of Surgical, Prosthetic and Training Aspects

Lectures and demonstrations by staff and visiting specialists will be presented. The Conference is open to doctors, limb makers, therapists and other rehabilitation personnel. Mrs. Noel Dousman, telephone Orange 3-6571, is registrar. The registration fee is $5.00.

Second International Poliomyelitis Conference: This conference has been scheduled for September 3-7, 1951 at the Medicinsk-Anatomisk Institut of the University of Copenhagen, in Copenhagen, Denmark. Sponsors of the meeting are the National Foundation for Infantile Paralysis of the United States and the Danish National Association for Infantile Paralysis. Presiding President of the Conference is Professor Niels Bohr of Copenhagen.

The Danish Royal Ministry for Foreign Affairs is extending invitations to sixty nations to send official delegates to the Conference. These delegates will report on poliomyelitis in their respective countries. Physicians and scientists interested in poliomyelitis are invited to attend. The Conference will invite representatives of societies and organizations interested in research and treatment of virus diseases.

Transportation and currency arrangements are being facilitated by Thomas Cook & Son, Wagon-Lits-Cook, and the American Express Company. Conference officials announced that the Swedish American Lines are making available the MS Stockholm, which is scheduled to leave New York on August 25 and to arrive at Copenhagen on September 2.

Requests for hotel accommodations and information concerning the Conference may be obtained from the Secretariate of the Second International Poliomyelitis Conference, Statens Seruminstitut, 80 Amager Boulevard, Copenhagen s, Denmark. The telegraphic address is Poliocon, Copenhagen.

Convention of American Medical Writers: The American Medical Writers' Association will hold its eighth annual meeting at the Pere Marquette Hotel, Peoria, Illinois, September 19. The Convention will be held during the sixteenth annual meeting of the Mississippi Valley Medical Society. An impressive program is in the making and the Association has inaugurated a quarterly bulletin to be published during 1951 under the editorship of Dr. Lee D. Van Antwerp.

New Books

Les Phlebites (Phlebitis) By Lucien Leger and Claude Frileux Paris Masson et Cie, 1950 Pp 300, with 85 illustrations

In late years there has been tremendous interest in diseases of the venous system Heretofore, except for a description of the various veins and their surgical treatment, little more than a chapter on phlegmasia alba dolens, perhaps, was all that was found in the usual textbook The latest researches on thromoophlebitis and phleobthrombosis have enriched our knowledge to an immense degree so far as psysiology and the pathologic conditions occurring in the venous system are concerned These studies have led to new approaches and new therapeutic measures resulting in great benefit to patients It is a well known fact that latent thrombosis may eventuate in the various embolic processes, thus endangering the patient s life or setting in train a variety of serious consequences

Dr Leger's work is a thorough study of the questions involved It attacks the subject from every point of view, the work has been done most painstakingly and constitutes an outstanding contribution to the contemporary surgical literature

A great deal of stress is laid on postoperative phlebitis, its recognition, prognosis and therapy The early diagnosis and clinical evaluation of signs and symptoms is supplemented by phlebographic study in case of doubt This method will often reveal latent thrombosis and thus point a way to the proper therapy

The chapters on phlebitis and embolism are highly instructive and enlightening Thrombosis of various types and origins is dealt with exhaustively, together with various therapeutic methods and their several indications

The authors condemn prolonged immobilization on the ground that it begets muscular atrophy and articular rigidity In therapy they make use of vasodilators, intra arterial injections, procaine hydrochloride, heparin, heat, refrigeration and roentgen therapy Among the surgical procedures employed by them are phlebectomy, thrombectomy followed by venous suture, and ligature of the deep femoral vein, the superficial femoral vein and the vena cava, respectively The technics of these operations and clinical reports of their results are included

An evaluation of the differences between so called 'functional phlebitis" and "surgical phlebitis' is an absorbing phase of the work Obstetric phlebitis in all its aspects is thoroughly analyzed It is pointed out that questions which obscure the etiologic and therapeutic understanding of this problem may often be solved by phlebography

Although the book presents many new ideas, older concepts and established methods are described as well The well-known laissez faire attitude so prevalent with regard to these conditions is deprecated and sounder therapeutic measures advocated

This work will provide an active impetus to progress and success in such procedures as the use of anticoagulants, surgical venous operations and prophylaxis It can be recommended unreservedly to students, medical men and surgeons, in fact, to all who are interested in the advancement of modern knowledge of diseases, their prevention and cure It is to be hoped that this classic work will be translated into English

Varicose Veins By R Rowden Foote St Louis The C V Mosby Company, 1949 Pp 226, with 181 illustrations and 2 color plates

Mentioning the fact that no book entirely devoted to the subject of varicose veins has apparently been available heretofore in the British literature, the author has based this work on a comprehensive foundation, including a discussion of the history of therapy with regard to varices The relevant anatomic, physiologic and pathologic data are explored

Study, diagnosis and treatment of varicose conditions make up the bulk of the subject-matter There is a chapter on varicose ulceration, a section on thrombophlebitis and pulmonary embolism, and a discussion of anticoagulant therapy Supportive and compression therapy are described

Rest and Pain By John Hilton Philadelphia and London J B Lippincott Company, 1951 Pp 503, with 104 illustrations

This welcome reissue of a famous medical classic has been newly edited by E W Walls, M D , Ch B , Professor of Anatomy in the University of London, and Elliot E Philipp, M A , M B , B Chir , M R C S , M R C O G , Hom Dem at Middlesex Hospital Medical School, in collaboration with H. J. B. Atkins, D.M., M.Ch., F.R.C.S., Director of the Department of Surgery at Guy's Hospital. It is the sixth edition and appears eighty-eight years after the original publication of the work by Bell and Daldy of Fleet Street, London.

As is well known, the work is a series of lectures. John Hilton was famous for his lifelong insistence on the restorative processes of nature. His name is indissolubly associated with such maxims as "Let well alone" and "Pain the monitor, rest the cure." He set great importance on pain as an aid in diagnosis.

Merely as reading, the lectures are as delightful as ever; and in this age of specialization and specialized equipment and technic the therapeutic precepts of Hilton are well worth restudying. The tremendous humanity and keen common sense of his approach are both unusual and stimulating.

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Hebrew Medical Journal, Vol. 2, 1950. Moses Einhorn, Editor.

With the publication of Volume 2, 1950, of *The Hebrew Medical Journal (Harofe Haivri)*, further aid is given to the newly established Hebrew University Medical School in Jerusalem through the contributions this Journal makes toward the development of the Hebrew medical literature. Containing articles written in Hebrew with English summaries, the twenty-third year of its publication has just been concluded under the editorship of Moses Einhorn, M.D.

Among the articles of particular interest is one by Dr. M. Temkin on the various infectious diseases which existed in Palestine and which have recently been checked by the Health Department of the Government of Israel. These diseases include malaria, typhoid fever, pappataci and amebiasis. Other worthwhile presentations are "Surgical Treatment of the Painful, Stiff Hip; The Resection-Angulation Operation" by Henry Milch, M.D., and "Electroencephalography and the Epilepsies" by Samuel J. Lipnitzky, M.D.

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Further information about the *Hebrew Medical Journal* may be obtained from the editorial office, 938 Park Avenue, New York 28, N. Y.

Immortal Magyar. By Frank G. Slaughter. New York: Henry Schumann, 1950. Pp. 210, with portrait illustrations.

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The main facts of Semmelweis' career are too well known to need recapitulation here. The fact remains, however, that the spirit of obstinate reaction to newly discovered truth is by no means dead or even moribund, and that, although violent persecution to the point of driving the discoverer mad no longer prevails, recent world events have clearly shown how easily the balance may be tipped toward retrogression and superstition. If for no other reason than this, it is worth while to ponder again the heroic and dramatic resistance, never abated, of one of the truly great figures in medical and surgical history.

The present biography is well and dispassionately written, by an author who is a surgeon as well as a novelist. It therefore carries the authentic atmosphere of professional life as well as the unprejudiced approach of the scientific mind. Nothing is overdrawn, for there is no need; the facts themselves are striking enough in all conscience. The book is a worthy addition to any library.

Abstracts from Current Literature

The Spread of Carcinoma of the Colon and Rectum. Grinnell, R S, Cancer 3 641 1950

In a study to correlate the prognosis with the pathologic picture (*1*) local spread (*2*) the venous circulation and (*3*) the lymphatics Robert S Grinnell of the Department of Surgery, Presbyterian Hospital, College of Physicians and Surgeons, Columbia University studied 86 carcinomas of the colon and 78 carcinomas of the rectum

Annular carcinomas of the colon showed a significantly higher incidence of vein invasion and a lower incidence of five year survival than did nonannular lesions In the rectum, the same trend toward greater vein invasion and poorer survival was seen in the annular carcinomas The small rectal lesions showed a significantly higher rate of node metastasis than did similar lesions in the colon They showed also a poorer five year survival rate than did lesions of the small colon, although this difference was not statistically significant in the limited number of cases involved It is concluded that small rectal carcinomas should have, with few exceptions, as radical an excision as larger ones

The incidence of vein invasion was 33 per cent for the colon and 36 per cent for the rectum It varied with the depth of penetration of the tumor in the bowel wall (Duke's classification *A* cases, 3 per cent, *B* cases, 25 per cent, *C* cases, 49 per cent) Thus vein invasion was relatively frequent before the muscle wall of the bowel was penetrated and was much more frequent after penetration, even before node involvement had occurred The five year survival rate was significantly affected by the presence or absence of vein invasions

Metastases to the liver were significantly more frequent when vein invasion was observed in the specimen than when it was not Involvement of the liver was not observed in any *A* cases but occurred in 11 *B* cases (28 per cent), showing the need for early operation to meet the threat of venous metastasis

The presence or absence of metastases to the nodes greatly influences the five year survival rate, and paralleled closely the effect of vein invasion on survival The dividing line in prognosis seems to fall between four to five metastic nodes, five for the colon and four for the rectum The data presented suggest that at least three fourths of the patients with more than five mestastic nodes may be expected to die within five years Extension of carcinoma to the veins is not so frequent as metastasis to the regional nodes but, when present, constitutes a nearly equal hazard to survival The need is for earlier as well as more radical surgical intervention to meet both these threats

H J ROSEVEAR, M D

Physiopsychologic Treatment for Postoperative Urinary Retention Treiger, P, Tovarek, J J and Casciato, N A, Am J Surg 80 195, 1950

The authors studied 2,000 consecutive surgical cases in one hospital to determine a means of preventing postoperative urinary retention The first 1,000 were taken from the files and showed an incidence of catheterization of 18 3 per cent The second 1,000 were treated by physiopsychologic methods—complete privacy, encouragement of the patient to void preoperatively from a recumbent position in order to overcome any existing psychic block, provision of a urinal or a bedpan at all times and within easy reach, and avoidance of asking the patient to void or whether he has voided prior to fourteen hours postoperatively

Early rising was practiced routinely, and the usual measures to relax a tense perineum were employed The catheter was used only if the patient had bladder discomfort or if the bladder was palpable or percussable abdominally In this group only 1 7 per cent required catheterization and there was no postopera tive urinary infection The 17 failures were all classified as neurotic Five patients had had previous surgical treatment with catheterization, 1 was a deaf mute, and 1 had postatism The authors conclude that in any hospital, in the average run of surgical patients, the incidence of postoperative urinary catheterization depends upon the knowledge of the surgeons and house staff as to the physiologic and psychologic facts involved

HOWARD S STERN, M D

Air Embolism in Blood Donors. Ende, N, and Ziskind, J, J A M 143 [illegible] 1950

Since the literature [illegible] reports collaboration with H. J. B. Atkins, D.M., M.Ch., F.R.C.S., Director of the Department of Surgery at Guy's Hospital. It is the sixth edition and appears eighty-eight years after the original publication of the work by Bell and Daldy of Fleet Street, London.

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Armamentarium

Postoperative Protection: A drug entitled Epsilan Phosphate, believed to prevent postoperative thrombi, has been introduced by the Warren-Teed Products Company It is asserted that Epsilan Phosphate will maintain high antithrombin levels intramuscularly, in conjunction with intravenous calcium gluconate The dangers of anticoagulant therapy are apparently avoided, particularly in preventing postoperative hemorrhagic diathesis

Sulfonamide Mixture: Tricombisul, a combination of sulfacetimide, sulfadiazine and sulfamerazine, has been developed by the Schering Corporation It is claimed that this preparation reduces the hazard of renal concrement formation almost to the vanishing point, and that it also diminishes the likelihood of allergic reactions Tricombisul is available in 0 5 Gm tablets in bottles of 100 and 1,000 tablets

New Drainage Cup: Codman & Shurtleff, Inc, of Boston has prepared a new drainage cup for ileostomies and fistulas A Bellinger Ileostomy Cup set comprises a lucite cup with adjustable baffle, two rubber cup bases, rubber cement, and protective paste Cups are available in three sizes 1¾ inches, 2½ inches and 3¼ inches inside diameter The distributors claim that the apparatus is most useful in the early postoperative period because it affords prompt removal of irritative discharges and protects the skin surrounding the stoma The Bellinger Cup may also be utilized satisfactorily in cecostomies and several types of fistula

Disinfectant Detergent: A preoperative hand preparation has been released by Winthrop-Stearns of New York, and it is said that this preparation disinfects after a two-minute scrub without the use of a brush A nonsensitizing disinfectant detergent reducing the number of postoperative wound infections, pHisoderm with hexachlorophene 3 per cent is absorbed by the skin, and low bacterial counts may be maintained if the detergent is used frequently It is packaged in bottles of 16 ounces and 1 U S gallon, and in 3 ounce refillable hand dispensers Plain pHisoderm is a sudsing detergent for use in all dematoses requiring thorough yet gentle cleansing It is available for average, dry or oily skin

Improved Blades: Improvements have been made upon Crescent surgical blades, says the Crescent Surgical Sales Company of New York It is claimed that the high-carbon, fined-grained Swedish steel tends to give longer life to the sharpness of the blade Also, Crescent Surgical Blades are now aluminum foil-wrapped, which renders them moisture proof in any climate

Six-Tube Centrifuge: Less time is required for tube balancing and sedimentation is induced faster with Gomco No 386 electric centrifuge, claims the Gomco Surgical Manufacturing Corporation of Buffalo, New York This centrifuge holds six 15-millimeter tubes for a 10 inch swing at a constant angle of 55 degrees It is quiet running, has a squat design and is provided with rubber feet which prevent it from creeping Fine speed adjustments may be made up to 3,200 revolutions per minute on alternating current

New Coronary Vasodilator. In introducing the new coronary vasodilator Eskel, Smith, Kline & French Laboratories of Philadelphia say of their product that the coronary dilating activity of "Eskel" is five times greater than that of aminophyllin "Eskel" has no demonstrable effect on the myocardium and only a negligible effect on blood pressure and pulse rate It is said to give marked relief to a high percentage of angina pectoris patients and is of considerable value in the treatment of chronic bronchial asthma The drug is packaged in bottles of 50 tablets, each tablet containing a mixture of active principles, chiefly khellin (extracted from the plant Ammi vishnaga), equivalent to 40 mg of crystalline khellin

Laboratory Press. For general research purposes in biology, physics or chemistry, a small but powerful laboratory press is presented by Fred S Carver, Inc, Hydraulic Equipment, of New York This instrument is said to provide pressures up to 20,000 pounds, temperatures to 400 F Interchangeable accessories are available for optional use and provide means of handling about 60 general applications of small scale pressing tests

Inert Gases: The Linde Air Products Company of New York and Toronto, a unit of the Union Carbide and Carbon Corporation, is offering helium, neon, argon, krypton and xenon in commercial size cylinders for laboratory use Information as to size, price, purity tolerance and special rare gas mixtures will be sent upon request of fatal and nonfatal air embolisms in blood donors, the authors studied the situation and devised a tube which they assert will help to prevent this unnecessary accident. In a series of experiments they determined that, when the vacuum has been lost in the collecting bottle, the increased venous pressure distal to the tourniquet will create positive pressure in the bottle, which on release of the tourniquet can force into the vein of the donor a quantity of air that may exceed the lethal dose.

The factors influencing the actual pressures reached in the bottle are (*1*) the pressure of the tourniquet; (*2*) the distance of the bottle below the donor, and (*3*) the total capacity of the bottle. The criteria required for the production of air embolism are (*1*) loss of vacuum in the bottle and (*2*) release of the tourniquet with the set still connected to the donor's vein. Loss of vacuum may be diagnosed by shaking the bottle; a loud, clear splashing sound indicates that the vacuum has been lost.

The authors recommend the addition of a small window to the usual plastic tubing, over which is placed a thin rubber diaphragm. The diaphragm is indented in the presence of a vacuum, and resumes its normal position when the vacuum is lost.

HOWARD S. STERN, M.D.

Prolapse of the Gastric Mucosa. Rudner, H. G., South M. J. 43:480, 1950.

Prolapse of the gastric mucosa was observed 22 times (2.8 per cent) by Rudner in a series of 785 patients on whom studies of the upper gastrointestinal tract were conducted over a one-year period.

This experience has convinced the author that the condition merits recognition as a clinical entity, although gastroenterologists generally have refused to concede that prolapse of the gastric mucosa has any pathologic significance. Although many ingenious theories have been brought forth, the basic abnormality in this condition is believed to be abnormal mobility of the mucosa upon the muscularis, associated with excessive peristalsis.

An outstanding feature of prolapse of the gastric mucosa is the inconstancy of its clinical manifestations in both degree and duration. In addition to the usual symptoms of the upper part of the gastrointestinal tract, there is chest pain with evidence of shock, as in coronary thrombosis, hematemesis, and melena. In fact, it is stated that bleeding may be the chief or even the sole manifestation of the disturbance. Between attacks, which usually begin thirty to sixty minutes after meals and which are relieved by vomiting, the patient may be quite comfortable.

The diagnosis depends entirely upon the results of roentgenographic study. Because the picture is a remarkably inconstant one, reported fluoroscopic studies and numerous serial roentgenograms may be necessary. The characteristic shadow is shaped like an open umbrella or a mushroom projecting into the duodenal bulb.

Treatment is conservative and symptomatic for all but the severely disabling condition, which renders surgical correction necessary. At operation, failure to palpate the lesion does not refute its existence. The surgeon should not hesitate to open the stomach under such circumstances provided the roentgen picture is conclusive. Some surgeons advise excision of the redundant mucosa and pyloroplasty, whereas others prefer partial or subtotal gastric resection.

It is important to state, as is developed in the discussion of Dr. Rudner's paper, that the existence of a prolapse which can of itself produce symptoms sufficiently severe to justify surgical treatment is viewed with considerable skepticism. It is stated also that the presence of prolapsing mucosa is not clinically significant and that hemorrhage, when it occurs in patients with prolapsing mucosa, is probably due to peptic ulceration, or hiatal hernia or some other definitive lesion.

THOMAS WILENSKY, M.D.

A Case of Uterus Didelphys with Unilateral Gynatresia. Embrey, M. P., Brit. Med. J. 1:820, 1950.

Developmental anomalies in the female genital tract can arise either from failure of canalization or from a lack of fusion of the mullerian ducts.

There can be no doubt of the infrequency of complete duplication of the genital tract (uterus didelphys) complicated by unilateral atresia with menstrual retention, as in the case described.

The association of congenital abnormalities in other systems with defects in the genital tract is discussed.

EDMUND LISSACK, M.D.

FOUNDED BY DR. MAX THOREK

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Vol XV APRIL, 1951 No 4

Original Articles

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DEAN SAUER M D F A C S, F I C S, AND VINCENT T HOUSTON, M D

ST LOUIS MISSOURI

ADMITTEDLY, a visceral resection must have for its purpose the saving of the patient's life, and this can be done only by complete removal of diseased and offending tissue The rehabilitation of the patient and the prevention of recurrence of the lesion, be it benign or malignant, are also primary considerations The abdominal surgeon is confronted increasingly with the necessity of extirpating not only a single viscus, but, more than occasionally, multiple viscera, if full restoration of the patient is ever to be attained The increasing frequency with which this problem has presented itself has led us to a study of 80 patients in whom two or more viscera were necessarily sacrificed in the attempt to achieve complete eradication of diseased tissue

Over the years we have been inevitably impressed and molded by the bold surgical work and thought of such men as Lahey, Brunschwig, Sugarbaker, Hunt and others Many factors have contributed to the safer execution of more extensive intra abdominal procedures Foremost among these is the fine skill developed by the modern physician anesthesiologist Of inestimable value is his ability to choose and direct the anesthetic agent or group of agents, which not only convey the patient through the operation with a minimal risk but permit a more complete and unhampered execution of the operator's technical facility and judgment Present also, and of great importance, are such things as the ready availability of blood for replacement and an increased appreciation of water and electrolyte balance, and measures for its control Last, the antibiotics are a factor, but these, in our opinion, are definitely of lesser importance

Our series of 80 patients whose advantage we felt could best be served by the removal of two or more viscera consisted of 30 whose lesions were benign and 50 who had malignant disease not limited to the viscus of origin

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Submitted for publication Feb 11 1951

From the Department of Surgery St. Louis University School of Medicine

In Memoriam

LAWRENCE L. ISEMAN

M.D., F.A.C.S., F.I.C.S.

Dr. Lawrence L. Iseman, prominent Chicago surgeon and former associate of the late John B. Murphy, died recently in the Wesley Memorial Hospital at the age of 71. Dr. Iseman was chief surgeon of the Illinois Central Hospital from 1915 to 1920 and professor of surgery at the Chicago Medical School from 1918 to 1930. He was attending surgeon at the Chicago Memorial Hospital. During the last twenty years of his life he had devoted much time to research in biochemistry and various allergies. He was particularly well known for his remarkable successes in the correction of obesity.

A graduate of Johns Hopkins, Dr. Iseman had been in practice in Chicago since 1908. A thoughtful and kindly man, introspective yet genially social, he made many friends not only among his patients and colleagues but among those who did not require his professional services.

Dr. Iseman was a member of the American Medical Association, the American College of Surgeons, the International College of Surgeons, the American Association for the Advancement of Science, the Illinois and Chicago Medical Societies, and Phi Delta Theta fraternity. He is survived by three sisters and a brother, to whom the heartfelt sympathy of his colleagues in the International College of Surgeons is extended.

TADEUSZ M. LARKOWSKI

M.D., F.A.C.S., F.I.C.S.

On Dec. 30, 1950, Dr. Tadeusz M. Larkowski, chief surgeon and chief of staff of St. Mary of Nazareth Hospital, Chicago, died at the age of 52. A graduate of the University of Chicago and Rush Medical School, Dr. Larkowski did postgraduate work at the Allgemeine Krankenhaus in Vienna, the Laboratory of Surgical Technique in Chicago, and the University of Illinois. He served his internship at St. Mary of Nazareth Hospital and was an attending surgeon at Cook County Hospital. Since 1925 Dr. Larkowski had been on the faculty of Loyola College of Medicine and had been professor of surgery since 1944. From 1940 to 1944 he was professor of surgery at the Cook County Graduate School of Medicine. His practice was devoted entirely to general surgery.

Dr. Larkowski was a member of the American Medical Association, the Chicago Medical Society, the Illinois State Medical Society, the American College of Surgeons, the International College of Surgeons, and was a Diplomate of the American Board of Surgery. The officers and members of the International College of Surgery extend the warmest sympathy to the bereaved.

EDWARD RODERICK BENEDICT McGEE

M.D., F.I.C.S.

Dr. Edward Roderick Benedict McGee, 73, died recently at Berlin, New Hampshire. He was a graduate of the University of Vermont and pursued his postgraduate studies at the New York Post-Graduate Medical School and the Harvard Medical School. In 1916 Dr. McGee took the Chevalier Jackson Course in Bronchoscopy and Esophogoscopy. During the first World War he served in the medical corps and later as major in the Medical Reserve Corps. He was senior surgeon in the St. Louis Hospital at Berlin, New Hampshire, for thirty-one years and was a member of the advisory board of that hospital from 1905 to 1936. He continued as a member of the visiting staff of the St. Louis hospital for many years.

Dr. McGee helped to organize and was senior surgeon of the Clinic Hospital in Berlin. In a teaching capacity he taught surgical nursing to the student nurses at the St. Louis Hospital. Active in the civic life in Berlin, Dr. McGee was mayor of the city for three consecutive terms and was director for many years of the Berlin Symphony Orchestra.

In addition to Fellowship in the International College of Surgeons, Dr. McGee was a member of the American Medical Association, the Coos County Medical Association (of which he was past president) and the New Hampshire Surgical Club.

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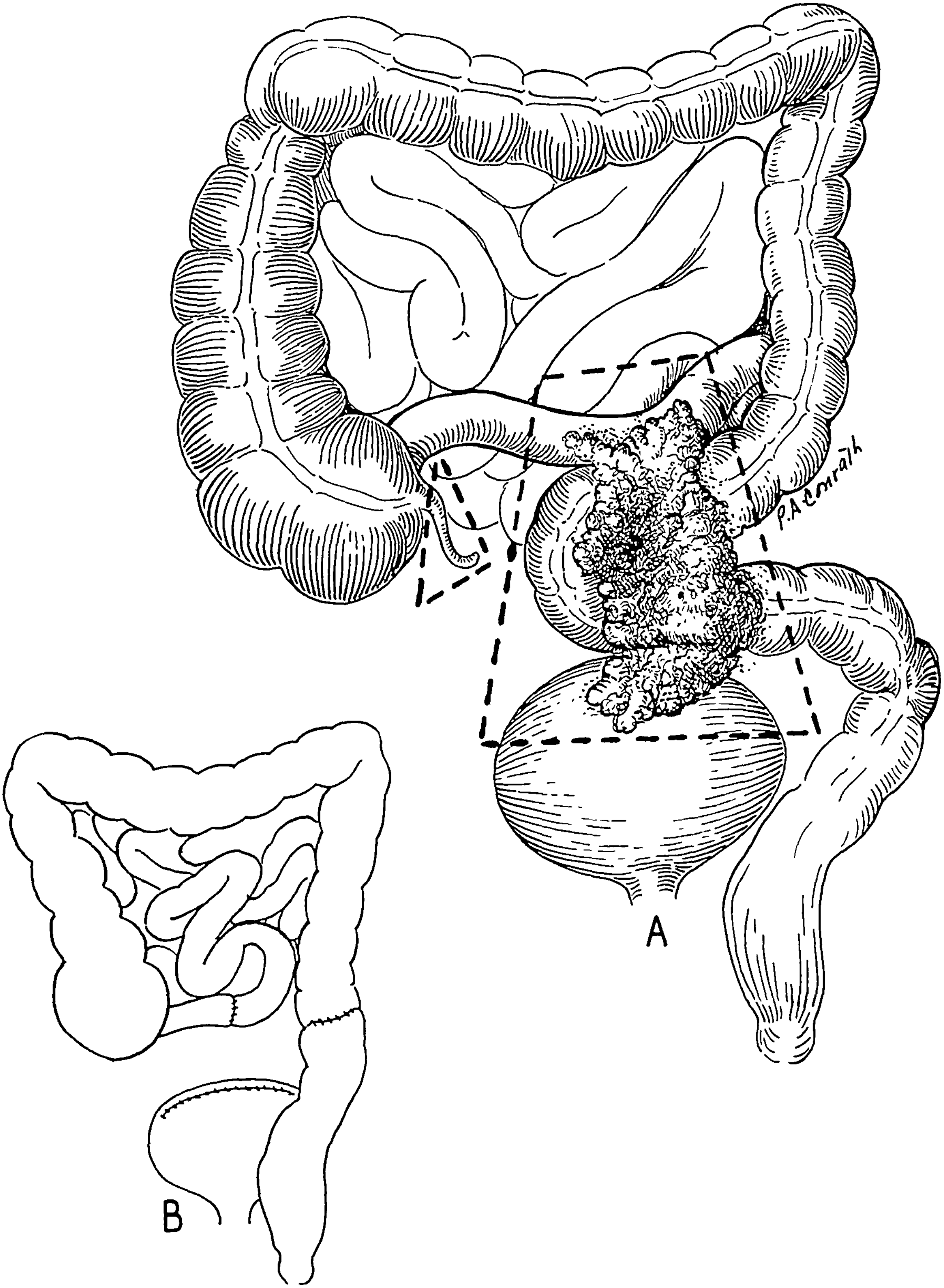

Fig. 1 *(Case 14)*.—T.B. *A*, carcinoma of the sigmoid colon involving the distal ileum and urinary bladder. Dotted lines indicate viscera resected. *B*, method of reconstruction. Single one-stage procedure.

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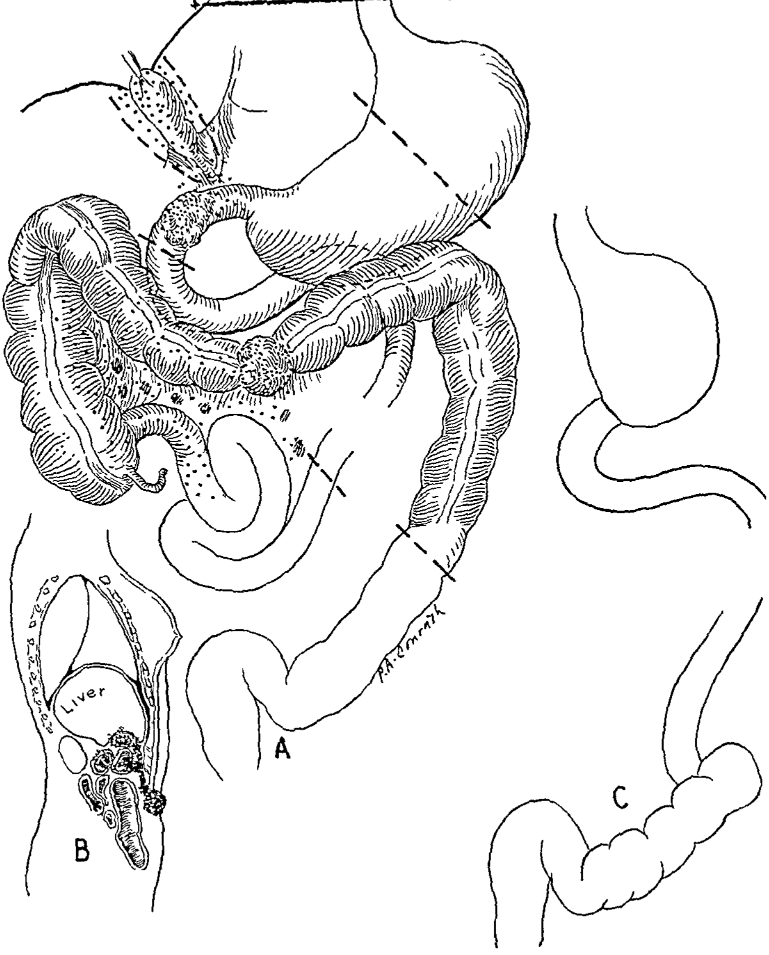

Fig. 2 (*Case 20*).—B.P. Carcinoma of transverse colon with metastasis to anterior abdominal wall, stomach, duodenum, liver and transverse mesocolon (*A* and *B*). Resection of the abdominal wall, ascending, transverse and descending colon, duodenum and stomach, portion of the liver and gallbladder. C, method of reconstruction. Single one-stage procedure.

MULTIPLE RESECTIONS FOR BENIGN LESIONS

One might well question the soundness of a judgment that would dictate a combination of visceral resections at one time rather than a single resection on separate occasions. However, the judicious choice of a simultaneous dual surgical exercise may not be indiscreet if all pathologic tissue is removed, leaving none to complicate further the postoperative period. We have been additionally fortified in this thought by the instances in which we have observed a smoldering viscus flare into an aggressive pathologic unit during the immediate postoperative course. A rupture of the gallbladder occurring at the end of one week in the

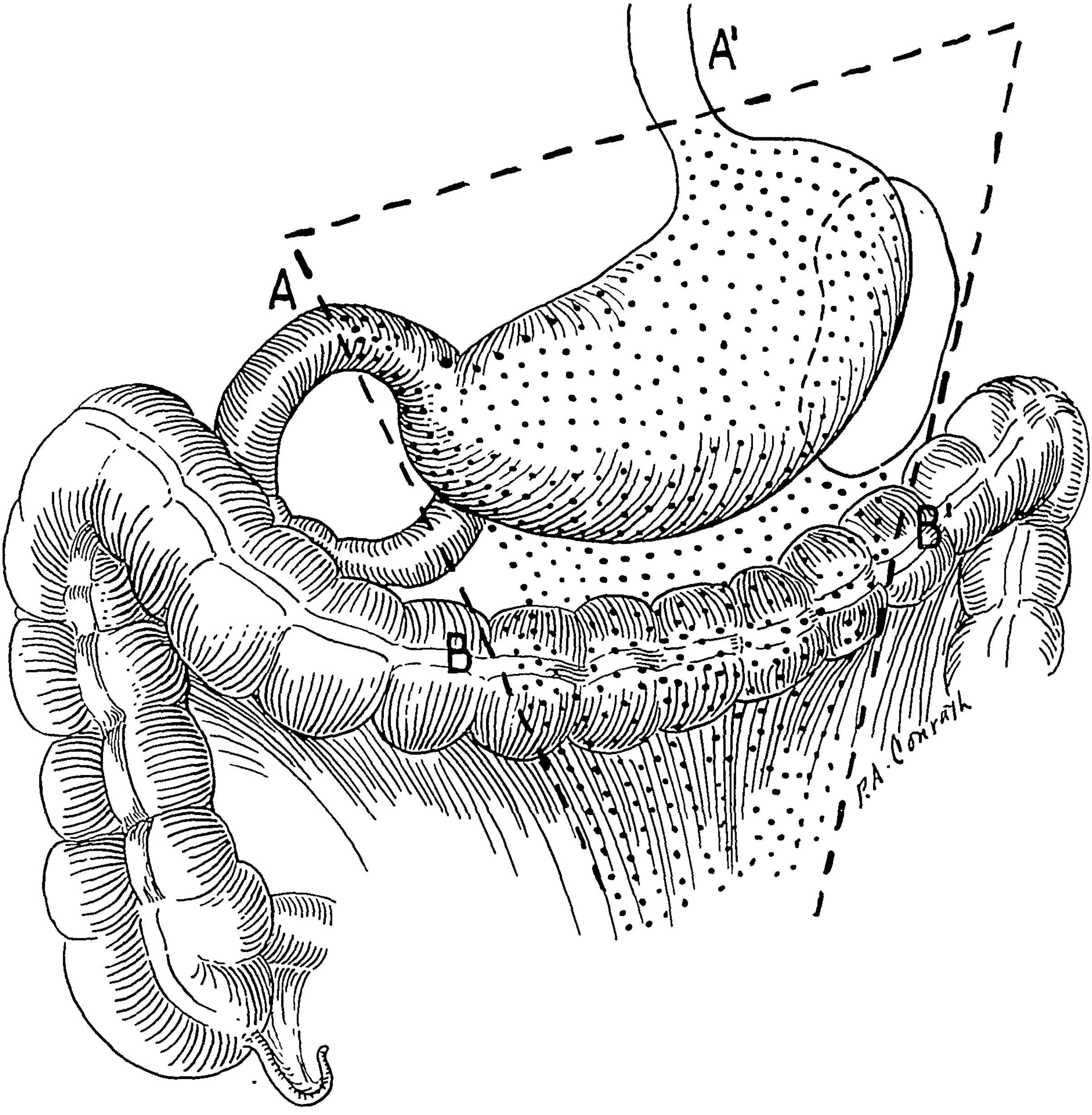

Fig. 3 (*Case 22*).—L.O. Carcinoma of the stomach with metastases to the transverse colon and spleen. Total gastrectomy, splenectomy, and resection of transverse colon. Continuity restored by esophagoduodenostomy and end-to-end anastomosis of colon. Single one-stage procedure.

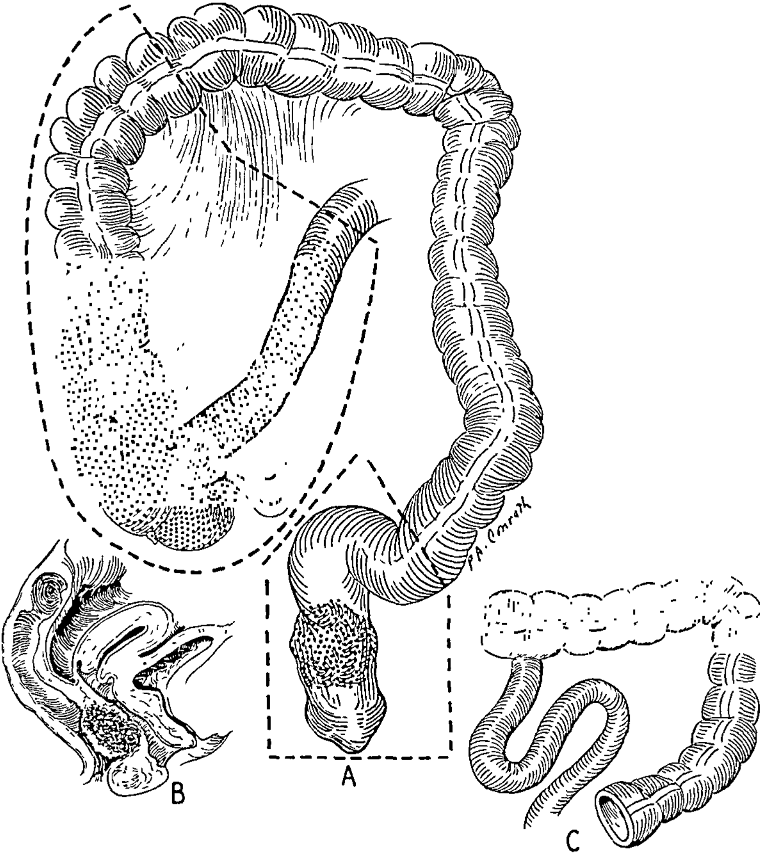

Fig. 4 (*Case 24*).—R.W. Advanced regional ileocolitis involving distal ileum and right half of transverse colon (*A* and *B*). Carcinoma of rectum ulcerating through posterior vaginal septum. Dotted lines indicate viscera resected. (Distal 4 feet of the ileum and right colon, sigmoid colon, rectum, anus and vagina.) Operation completed in two stages. *C*, method of reconstruction.

gastrectomized patient, as well as the inflammation and perforation of an appendix immediately after gastrectomy and again after colon resection, has been observed. The strangulation of an ovarian cyst after cholecystectomy and the intussusception of ileum occasioned by Meckel's diverticulum as an almost immediate sequel to hysterectomy have combined to urge the elimination of multiple benign

MULTIPLE RESECTIONS FOR BENIGN LESIONS

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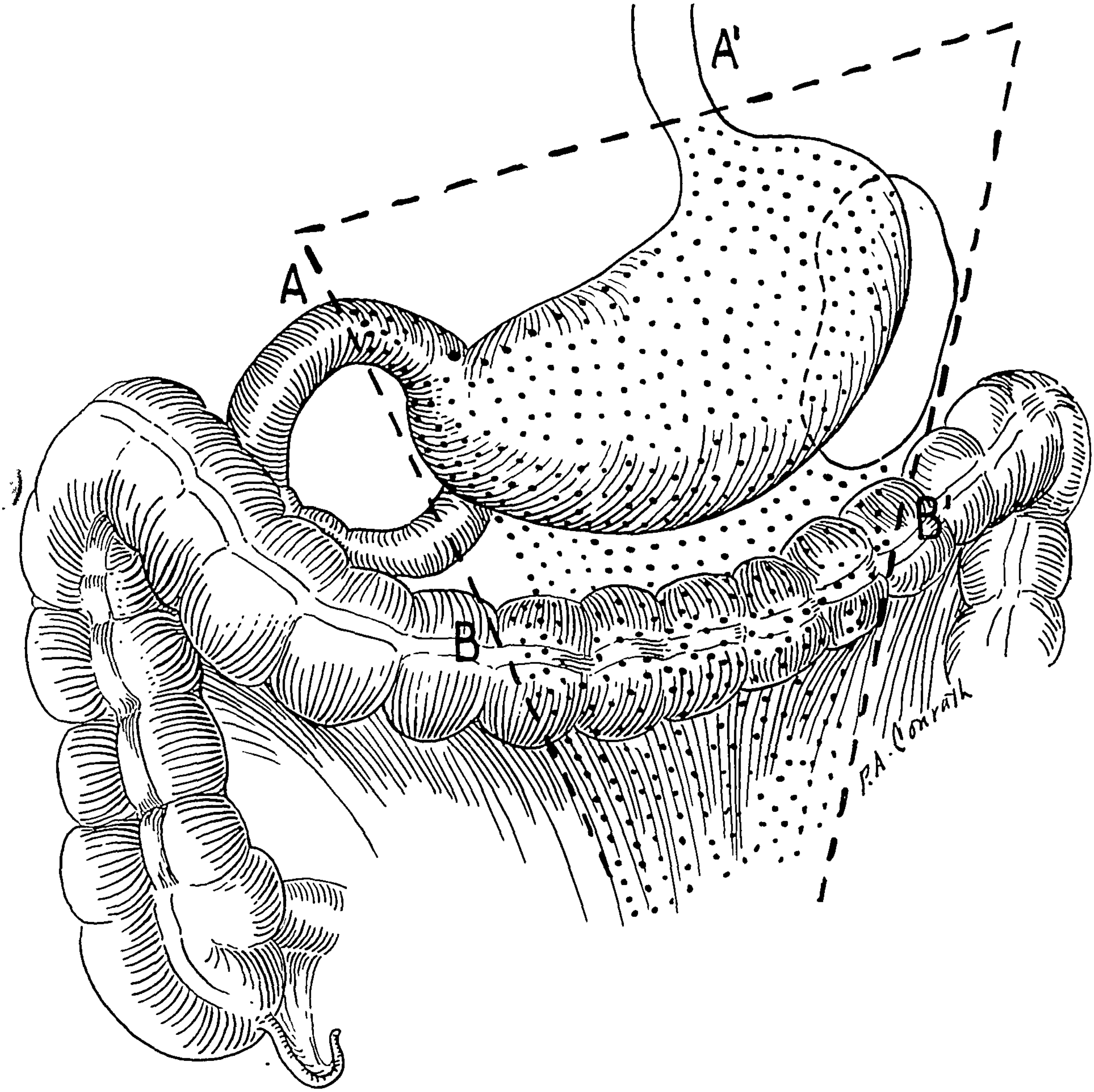

Fig. 3 (*Case 22*).—L.O. Carcinoma of the stomach with metastases to the transverse colon and spleen. Total gastrectomy, splenectomy, and resection of transverse colon. Continuity restored by esophagoduodenostomy and end-to-end anastomosis of colon. Single one-stage procedure.

TABLE 1.—*(Continued)*—*Multiple Resections for Benign Lesions*

Case No	Age	Sex	Diagnosis	Viscera Resected Primarily	Viscera Resected Concomitantly	Operative Procedure and Method of Reconstruction	Result	Survival Period
54 (R H)	48	M	Volvulus of ileum Portal hypertension Congestive splenomegaly	Ileum	Spleen	Resection of ileum—primary end-to-end anastomosis Splenectomy	Died of renal and hepatic failure	15 hours
55 (M G)	52	F	Duodenal ulcer Gastric ulcer Chronic cholecystitis Cholelithiasis Fibromyomata of uterus	Stomach and duodenum	Gallbladder	Duodenectomy with excision of ulcer Gastrectomy with excision of ulcer Hofmeister—anterior contraperistaltic gastrojejunostomy Cholecystectomy	Alive and well	1 year 8 months
56 (N H)	55	M	Duodenal ulcer Chronic cholecystitis Cholelithiasis	Stomach and duodenum	Gallbladder	Duodenectomy with excision of ulcer Hofmeister gastrectomy Anterior contraperistaltic gastrojejunostomy Cholecystectomy	Alive and well	4 years
57 (R K)	41	F	Chronic cholecystitis Cholelithiasis Congestive splenomegaly	Gallbladder	Spleen	Cholecystectomy Splenectomy	Alive and well	3 years 3 months
58 (I L)	36	F	Chronic cholecystitis Cholelithiasis Right ovarian cyst	Gallbladder	Ovary	Cholecystectomy Oophorectomy	Alive and well	4 years 6 months
59 (J L)	64	F	Duodenal ulcer Chronic cholecystitis Cholelithiasis	Stomach and duodenum	Gallbladder	Hofmeister duodenostomy with excision of ulcer Hofmeister gastrectomy anterior contraperistaltic gastrojejunostomy Cholecystectomy	Alive and well	3 years 4 months
60 (F M)	51	M	Duodenal ulcer Chronic cholecystitis Cholelithiasis	Stomach and duodenum	Gallbladder	Duodenectomy with excision of ulcer Hofmeister gastrectomy anterior contraperistaltic gastrojejunostomy	Alive and well	1 year
61 (J R)	65	M	Duodenal ulcer Chronic cholecystitis	Stomach and duodenum	Gallbladder	Duodenectomy with excision of ulcer Hofmeister gastrectomy anterior contraperistaltic gastrojejunostomy Cholecystectomy	Alive and well	1 year
62 (R S)	4[illegible]	F	Duodenal ulcer Chronic cholecystitis Cholelithiasis	Stomach and duodenum	Gallbladder	Duodenectomy with excision of ulcer Gastrectomy Gastroduodenostomy Billroth No 1 Cholecystectomy	Alive and well	2 years

TABLE 1.—*Multiple Resections for Benign Lesions*

Case No.	Age	Sex	Diagnosis	Viscera Resected Primarily	Viscera Resected Concomitantly	Operative Procedure and Method of Reconstruction	Result	Survival Period
15 (H.D.)	37	F	Uterine nyomas Ulcerative colitis Bilateral ovarian cysts	Entire colon, rectum and anus	Uterus, tubes and ovaries	Permanent ileostomy—abdominoperineal resection Total colectomy Total hysterectomy	Alive and well	5 years 8 months
28 (R.L.)	38	F	Obstruction of signoid colon due to endometriosis Uterine fibromyoms	Sigmoid colon	Uterus, tubes and ovaries	Resection of sigmoid colon—primary end-to-end anastomosis Total hysterectomy Bilateral salpingo-oophorectomy	Alive and well	1 year 7 months
34 (J.B.)	41	M	Progressive enterocolitis involving colon and small intestine with multiple abdominal wall sinuses	Entire ilium and right and left halves of colon	....	Ileosigmoidostomy—primary end-to-end anastomosis	Alive and well	7 years 6 months
42 (C.G.)	57	M	Multiple, traumatic, ileal and jejunal fistulas	Ileum and jejunum	....	Ileojejunostomy—primary end-to-end anastomosis	Alive and well	2 years
43 (M.G.)	56	F	Cholecystoduodenal fistula Ileal fistula Cholecystitis with stones Common duct obstruction	Ileum	Gallbladder	Resection of ileum and primary end-to-end anastomosis Cholecystectomy and choledochotomy Closure of duodenal fistula	Alive and well	3 years 6 months
44 (G.J.)	41	F	Chronic pelvic inflammatory disease Pelvic endometriosis Endometriosis of the ileum	Uterus, tubes and ovaries	Ileum	Total hysterectomy Bilateral salpingo-oophorectomy Resection of ileum—primary end-to-end anastomosis	Alive and well	2 years 6 months
50 (J.A.)	62	M	Duodenal ulcer perforating into the pancreas Chronic cholecystitis Cholelithiasis	Stomach and duodenum	Gallbladder	Gastrectomy, Hofmeister type Anterior, isoperistaltic gastrojejunostomy Cholecystectomy	Alive and well	4 years 4 months
51 (M.C.)	35	F	Melena, cause undetermined	Duodenum	Gallbladder right salpinx	Duodenal diverticulectomy Cholecystectomy Salpingectomy	Alive and well	5 years 6 months
52 (R.C.)	38	F	Duodenal ulcer Chronic cholecystitis Cholelithiasis	Stomach and duodenum	Gallbladder	Gastrectomy, Hofmeister type Duodenectomy with excision of ulcer Anterior, contraperistaltic gastrojejunostomy Cholecystectomy	Alive and well	1 year 6 months
53 (V.D.)	29	M	Duodenal ulcer Cholecystitis	Stomach and duodenum	Gallbladder	Duodenectomy with excision of ulcer Hofmeister gastrectomy—anterior, contraperistaltic gastrojejunostomy Cholecystectomy	Alive and well	1 year 6 months

TABLE 1 —(*Continued*)—*Multiple Resections for Benign Lesions*

Case No	Age	Sex	Diagnosis	Viscera Resected Primarily	Viscera Resected Concomitantly	Operative Procedure and Method of Reconstruction	Result	Survival Period
76 (L B)	65	M	Chronic duodenal ulcer with erosion into the pancreatic head and massive hemorrhage	Stomach and duodenum	Common duct Pancreatic duct	Gastrectomy—antecolic antiperistaltic gastrojejunostomy Resection of common duct—end to side choledochoduodenostomy Resection of pancreatic duct—end to end anastomosis	Alive and well	5 years
80 (V I)	19	M	Duodenal ulcer with obstruction Chronic cholecystitis Cholelithiasis	Stomach and duodenum	Gallbladder	Hofmeister gastrectomy—anterior antiperistaltic gastrojejunostomy Cholecystectomy	Alive and well	4 years

entities at the primary operative intervention Thus, it has not been thought unwise to superimpose cholecystectomy upon total hysterectomy where calculus impacted in the cystic duct seemingly had already prepared the swollen and distended gallbladder for progressive inflammatory change Similarly, cholecystectomy has been added to gastrectomy, oophorectomy and colectomy Ileectomy and jejunectomy have been necessary in the management of intestinal fistulas of various origins The common and pancreatic ducts also have been resected and reconstructed in cases of stenosing choledochal and pancreatic inflammation incident to long-standing duodenal ulceration Additional benign entities have been eliminated simultaneously, as set forth in Table 1

Age and Sex Incidence—The average age of 30 patients requiring multiple resections for benign intra abdominal lesions was 49 years Twelve were men and 18 were women

Operative Mortality and Cause of Death—The death of any patient succumbing within the first three weeks was considered an operative death The mortality rate was 6 6 per cent One patient died of bile peritonitis following gastric and pancreatic resection Another, with severe portal hypertension incident to cirrhosis, died of progressive hepatic and renal failure following massive resection of gangrenous ileum and splenectomy

Survival Rate—Twenty-eight of 30 patients are alive, well and rehabilitated, with an average survival period of three years at the time of writing It may be reasonably assumed that these 28 survivors who underwent multiple resections for benign disease will not ultimately die of the lesions for which surgical treatment was instituted

MULTIPLE RESECTIONS FOR MALIGNANT LESIONS

In the light of our limited knowledge of malignant disease, total ablation of an abdominal cancer can be achieved only by radical removal of the viscus in which

TABLE 1.—(*Continued*)—*Multiple Resections for Benign Lesions*

Case No.	Age	Sex	Diagnosis	Viscera Resected Primarily	Viscera Resected Concomitantly	Operative Procedure and Method of Reconstruction	Result	Survival Period
63 (E.T.)	48	F	Duodenal ulcer Chronic cholecystitis Cholelithiasis	Stomach and duodenum	Gallbladder	Duodenectomy with excision of ulcer Hofmeister gastrectomy—anterior contraperistaltic gastrojejunostomy Cholecystectomy	Alive and well	1 year 6 months
64 (C.T.)	31	M	Gastric diverticulum Chronic cholecystitis Cholelithiasis	Stomach	Gallbladder	Gastric diverticulectomy Cholecystectomy	Alive and well	1 year
65 (T.W.)	79	F	Chronic cholecystitis Cholelithiasis Duodenal diverticulum	Gallbladder	Duodenum	Cholecystectomy Choledochotomy Duodenal diverticulectomy	Alive and well	9 months
66 (V.W.)	59	F	Chronic cholecystitis Cholelithiasis Fibroma of duodenum	Gallbladder	Duodenum	Cholecystectomy Duodenectomy to include fibroma	Alive and well	5 years
67 (J.E.)	63	M	Perforating duodenal ulcer involving pancreatic head	Stomach and Duodenum	Common duct Pancreatic duct	Duodenectomy with excision of ulcer Hofmeister gastrectomy—anterior contraperistaltic gastrojejunostomy Choledochocholedochostomy Reimplantation of pancreatic duct into the duodenum	Died of bile peritonitis	10 weeks
70 (C.M.)	44	F	Large right ovarian cyst Empyema of gallbladder Cholelithiasis	Gallbladder	Right ovary	Cholecystectomy Right oophorectomy	Alive and well	1 year 3 months
72 (M.P.)	40	F	Uterine fibromyomas Chronic cholecystitis Cholelithiasis	Uterus Tubes Ovaries	Gallbladder	Total hysterectomy Bilateral salpingo-oophorectomy Cholecystectomy	Alive and well	5 years
73 (D.L.)	45	F	Uterine fibromyomas Chronic cholecystitis Cholelithiasis with stone impacted in ampulla of gallbladder	Uterus Tubes Ovaries	Gallbladder	Total hysterectomy Bilateral salpingo-oophorectomy Cholecystectomy	Alive and well	4 years 6 months
75 (G.H.)	42	F	Chronic pelvic inflammatory disease Chronic cholecystitis Cholelithiasis	Uterus Tubes	Gallbladder	Total hysterectomy Bilateral salpingo-oophorectomy	Alive and well	3 months

TABLE 3 (*Continued*)—*Multiple Resections for Malignant Lesions*

Case No	Age	Sex	Diagnosis	Viscera Resected Primarily	Viscera Resected Concomitantly	Operative Procedure and Method of Reconstruction	Result	Survival Period
10 (E R)	64	M	Carcinoma of rectum with invasion of seminal vesicle	Anus rectum Sigmoid colon	Right ductus deferens and seminal vesicle	Abdominoperineal resection Resection of right ductus deferens and right seminal vesicle	Died of massive pulmonary embolism	5 days
11 (H R)	74	M	Carcinoma of stomach with metastasis to body of pancreas	Stomach	Body of pancreas	Gastrectomy—anterior gastrojejunostomy Partial pancreatectomy	Alive and well	4 years 9 months
12 (G M)	78	M	Carcinoma of sigmoid colon metastasis to distal ileum	Sigmoid colon	Ileum	Obstructive resection of sigmoid colon Resection and primary end to end anastomosis of ileum	Alive and well	1 year 11 months
13 (B I)	37	F	Recurrent carcinoma of sigmoid colon with metastasis to vagina and anterior abdominal wall	Sigmoid colon	Vagina Abdominal wall	Resection of sigmoid colon and primary end to end anastomosis Resection of superior vagina Resection of abdominal wall	Alive and well	1 year 6 months
14 (T B)	50	M	Carcinoma of sigmoid colon with metastasis to urinary bladder and ileum	Sigmoid colon	Urinary bladder and ileum	Resection of sigmoid colon and primary end to end anastomosis Partial cystectomy Resection of ileum—primary end-to-end anastomosis	Alive and well	1 year 9 months
16 (J P)	63	F	Carcinoma of sigmoid colon with metastasis to liver	Sigmoid colon	Liver Gallbladder	Resection of sigmoid colon and primary end to end anastomosis Partial hepatectomy Cholecystectomy	Died of bilateral pyelonephritis	1 year 3 months
17 (L P)	42	M	Multiple polyposis of colon Carcinoma of sigmoid colon with metastasis to left ductus deferens	Colon rectum and anus	Ductus deferens	Total colectomy Abdominoperineal resection Permanent ileostomy Resection of ductus deferens	Alive and well	2 years 3 months
18 (L R)	75	F	Carcinoma of rectum Stenosing diverticulitis of sigmoid colon	Rectum and anus	Descending colon	Left colectomy Abdominoperineal resection	Alive and well	8 months
19 (J S)	57	M	Carcinoma of stomach with metastasis to body of pancreas	Stomach	Pancreas	Gastrectomy Partial pancreatectomy	Alive and well	10 years

TABLE 3.—*Multiple Resections for Malignant Lesions*

Case No.	Age	Sex	Diagnosis	Viscera Resected Primarily	Viscera Resected Concomitantly	Operative Procedure and Method of Reconstruction	Result	Surviva Period
1 (M.M.)	53	F	Carcinoma of sigmoid colon; chronic cholecystitis; cholelithiasis	Sigmoid colon	Gallbladder	Resection of sigmoid colon—primary end-to-end anastomosis Cholecystectomy	Alive and well	8 months
2 (E.N.)	67	F	Carcinoma of descending colon with mesenteric noda involvement and extension to left ureter	Left half of transverse colon, descending colon and sigmoid colon	Left kidney Left ureter	Resection of left colon—primary end-to-end anastomosis of transverse colon and rectum	Died of recurrence	1 year
3 (I.P.)	58	F	Neurofibrosarcoma of celiac plexus; large gastric ulcer	Celiac plexus	Stomach	Excision of tumor mass Gastrectomy—gastroduodenostomy	Alive and well	8 months
4 (B.P.)	26	F	Colloid carcinoma of rectum with metastasis to vaginal wall	Sigmoid, rectum and anus	Posterior vaginal wall	Abdominoperineal resection Resection of posterior vaginal wall	Alive and well	1 year
5 (O.R.)	50	M	*Carcinoma of stomach with* metastasis to transverse mesocolon nodes	Stomach	Hepatic flexure of colon	Gastric resection—anterior gastrojejunostomy Resection of hepatic flexure of colon—end-to-end anastomosis of right colon	Alive and well	7 months
6 (J.S.)	51	M	Carcinoma of cecum with metastasis to abdominal wall	Right colon	Right lower abdominal wall quadrant	Right hemicolectomy—primary ileotransverse colostomy Resection of right lower abdominal wall	Alive and well	6 months
7 (O.Z.)	67	M	Carcinoma of ascending colon with metastasis to abdominal wall	Right colon	Right lower abdominal wall quadrant	Right hemicolectomy—primary ileotransverse colostomy Resection of right lower abdominal wall	Alive and well	2 years
8 (M.W.)	76	F	Carcinoma of pancreas with duodenal invasion	Pancreas	Stomach Duodenum	Total pancreatectomy Duodenectomy Gastric resection—anterior contraperistaltic gastrojejunostomy Choledochojejunostomy	Died of recurrence	7 months
9 (E.S.)	61	F	Carcinoma of rectum with metastasis to liver	Sigmoid rectum and anus	Liver Gallbladder	Abdominoperineal resection Partial hepatectomy Cholecystectomy	Died of hepatic metastasis	1 year

TABLE 3 *(Continued)—Multiple Resections for Malignant Lesions*

Case No	Age	Sex	Diagnosis	Viscera Resected Primarily	Viscera Resected Concomitantly	Operative Procedure and Method of Reconstruction	Result	Survival Period
10 (E R)	64	M	Carcinoma of rectum with invasion of seminal vesicle	Anus rectum Sigmoid colon	Right ductus deferens and seminal vesicle	Abdominoperineal resection Resection of right ductus deferens and right seminal vesicle	Died of massive pulmonary embolism	5 days
11 (H R)	74	M	Carcinoma of stomach with metastasis to body of pancreas	Stomach	Body of pancreas	Gastrectomy—anterior gastrojejunostomy Partial pancreatectomy	Alive and well	4 years 9 months
12 (G M)	78	M	Carcinoma of sigmoid colon, metastasis to distal ileum	Sigmoid colon	Ileum	Obstructive resection of sigmoid colon Resection and primary end-to end anastomosis of ileum	Alive and well	1 year 11 months
13 (B L)	37	F	Recurrent carcinoma of sigmoid colon with metastasis to vagina and anterior abdominal wall	Sigmoid colon	Vagina Abdominal wall	Resection of sigmoid colon and primary end to end anastomosis Resection of superior vagina Resection of abdominal wall	Alive and well	1 year 6 months
14 (I B)	50	M	Carcinoma of sigmoid colon with metastasis to urinary bladder and ileum	Sigmoid colon	Urinary bladder and ileum	Resection of sigmoid colon and primary end to end anastomosis Partial cystectomy Resection of ileum—primary end to end anastomosis	Alive and well	1 year 9 months
16 (J P)	63	F	Carcinoma of sigmoid colon with metastasis to liver	Sigmoid colon	Liver Gallbladder	Resection of sigmoid colon and primary end to end anastomosis Partial hepatectomy Cholecystectomy	Died of bilateral pyelonephritis	1 year 3 months
17 (L P)	42	M	Multiple polyposis of colon Carcinoma of sigmoid colon with metastasis to left ductus deferens	Colon rectum and anus	Ductus deferens	Total colectomy Abdominoperineal resection Permanent ileostomy Resection of ductus deferens	Alive and well	2 years 3 months
	5	F	Carcinoma of rectum Stenosing diverticulitis of sigmoid colon	Rectum and anus	Descending colon	Left colectomy Abdominoperineal resection	Alive and well	8 months
	7	M	Carcinoma of stomach with metastasis to body of pancreas	Stomach	Pancreas	Gastrectomy Partial pancreatectomy	Alive and well	10 years

TABLE 3. *(Continued)—Multiple Resections for Malignant Lesions*

Case No.	Age	Sex	Diagnosis	Viscera Resected Primarily	Viscera Resected Concomitantly	Operative Procedure and Method of Reconstruction	Result	Survival Period
20 (B.P.)	76	F	Carcinoma of transverse colon with local metastasis and widespread mesenteric and hepatic metastasis	Ileum and right colon	Right colon Stomach and duodenum Liver and gallbladder Anterior abdominal wall	Resection of ileum and right and left colons ileosigmoidostomy Duodenectomy and gastric resection —gastrojejunostomy Resection of liver Cholecystectomy Resection of anterior abdominal wall	Died of widespread metastasis	9 months
21 (P.K.)	66	F	Carcinoma of rectum with metastasis to ileum	Anus, rectum Sigmoid colon	Ileum	Abdominoperineal resection Resection of ileum and primary end-to-end anastomosis	Died of recurrence	10 months
22 (L.O.)	50	F	Linitis plastica of stomach with metastasis to transverse colon and mesocolon	Stomach	Spleen Transverse colon	Total gastrectomy—gastroesophagostomy Splenectomy Transverse colectomy—primary end-to-end anastomosis	Died of recurrence	4 months
23 (H.H.)	58	M	Carcinoma of transverse colon with metastasis to ileum	Right colon	Ileum	Right hemicolectomy—primary ileotransverse colostomy Massive resection of ileum—ileoileostomy	Died of recurrence	6 months
24 (R.W.)	38	F	Regional ileocolitis Carcinoma of rectum with rectovaginal fistula	Sigmoid, rectum and anus	Ileum Right colon Vagina	Abdominoperineal resection Right hemicolectomy and resection of 6 feet of ileum—end-to-side ileotransverse colostomy Resection of posterior vaginal wall	Alive and well	1 year 3 months
25 (J.D.)	70	F	Carcinoma of rectum with direct extension metastasis to right common iliac vein	Anus, rectum and sigmoid colon	Right common iliac vein	Abdominoperineal resection Resection of right common iliac vein	Alive and well	2 years 2 months
26 (E.M.)	67	F	Carcinoma of sigmoid colon with direct extension metastasis to ileum Multiple uterine fibromyomas	Sigmoid colon	Ileum Uterus Tubes and ovaries	Resection of sigmoid colon—primary end-to-end anastomosis Resection of ileum—primary end-to-end anastomosis Supracervical hysterectomy and bilateral salpingo-oophorectomy	Alive and well	5 years
27 (G.K.)	45	M	Sarcoma arising from small intestine	Ileum and jejunum	Abdominal wall	Resection of Ileum—primary end-to-end anastomosis Resection of jejunum—primary end-to-end anastomosis Resection of right lower abdominal wall	Died of disseminated recurrence	3 years 6 months

TABLE 3 (*Continued*)—*Multiple Resections for Malignant Lesions*

Case No	Age	Sex	Diagnosis	Viscera Resected Primarily	Viscera Resected Concomitantly	Operative Procedure and Method of Reconstruction	Result	Survival Period
29 (D G)	63	F	Sarcoma of uterus with direct extension metastasis to distal ileum cecum, ascending colon and pancreas	Uterus Tubes and ovaries	Distal ileum Right colon Pancreas	Total hysterectomy Bilateral salpingo-oophorectomy Resection of distal ileum and right colon, primary end-to-side ileo-transverse colostomy Partial pancreatectomy	Alive and well	10 months
30 (M D)	67	F	Carcinoma of stomach with invasion of right lobe of liver Cholecystogastric	Stomach	Liver Gallbladder	Gastrectomy—gastroduodenostomy Partial hepatectomy Cholecystectomy	Died of uremia	8 days
31 (A F)	10	I	Carcinoma of stomach with invasion of pancreas	Stomach	Pancreas Spleen	Total gastrectomy—esophagojejunostomy Partial pancreatectomy Splenectomy	Died of recurrence	6 months
32 (L ( )	51	M	Carcinoma of the duodenum with pancreatic and transverse mesocolon invasion	Duodenum	Stomach Pancreas Common duct Transverse colon	Gastrectomy—Gastroduodenostomy Resection of pancreas and common duct—cholecystogastrostomy Obstructive resection of transverse colon	Died of bile peritonitis	9 days
33 (J C)	69	M	Carcinoma of cardia of stomach invading Tail of pancreas and extending into spleen Empyema of gallbladder	Stomach	Pancreas Spleen	Gastrectomy (95%)—gastroesophagostomy Partial pancreatectomy Splenectomy Cholecystostomy	Died of left pleural empyema	10 days
35 (C A)	67	M	Carcinoma of stomach with invasion of transverse colon	Stomach	Transverse colon	Gastrectomy—gastrojejunostomy Obstructive resection of transverse colon	Died of bacterial peritonitis	3 weeks
R)	60	F	Carcinoma of hepatic flexure of colon with invasion of right kidney right renal vein and vena cava	Right colon	Right kidney Inferior vena cava wall	Right hemicolectomy—primary end to side ileotransverse colostomy Right nephrectomy Resection (elliptic) of inferior vena cava	Died of renal failure	5 days
37 (H R)	60	I	Carcinoma of gallbladder invading liver and duodenum	Gallbladder	Liver Duodenum Stomach	Cholecystectomy Partial hepatectomy Gastrectomy and duodenectomy—gastroduodenostomy	Died of recurrence	5 months

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TABLE 3. *(Continued)—Multiple Resections for Malignant Lesions*

Case No.	Age	Sex	Diagnosis	Viscera Resected Primarily	Viscera Resected Concomitantly	Operative Procedure and Method of Reconstruction	Result	Survival Period
38 (S.M.)	72	F	Carcinoma of stomach invading body of pancreas	Stomach	Pancreas	Gastrectomy—gastroduodenostomy Partial pancreatectomy	Alive and well	1 year
39 (J.D.)	60	M	Carcinoma of rectum with metastasis to prostate and seminal vesicles	Anus, rectum, sigmoid colon	Prostate Seminal vesicles	Abdominoperineal resection Prostatectomy Resection of seminal vesicles	Dien anesthetic death	1 hour
40 (L.D.)	41	F	Carcinoma of rectum with metastasis to vagina Diabetes mellitus Gangrene of left foot	Anus, rectum, sigmoid colon	Vagina Left lower extremity	Abdominoperineal resection Resection of posterior vaginal septum Midthigh amputation of left lower extremity	Died of recurrence	3 years
41 (K.G.)	37	F	Carcinoma of stomach with wide nodal involvement and direct extension into liver	Stomach	Liver	Gastrectomy—gastrojejunostomy Resection of liver	Died of recurrence	6 months
45 (L.K.)	74	F	Carcinoma of distal end of common bile duct	Common bile duct	Duodenum Stomach Pancreas	Gastrectomy and duodenectomy—*retrocolic, contraperistaltic gastrojejunostomy* Resection of common bile duct—choledochoduodenostomy Resection of pancreas—pancreatocholedochostomy	Died of *hepatitis*	1 month
46 (A.L.)	63	F	Carcinoma of stomach with direct extension metastasis to pancreas	Stomach	Pancreas Spleen	Total gastrectomy—esophagoduodenostomy Partial pancreatectomy Splenectomy	Died of recurrence	4 months
47 (J.M.)	54	M	Carcinoma of rectum with direct extension metastasis to prostate	Anus, rectum, sigmoid colon	Prostate	Abdominoperineal resection Prostatectomy	Alive and well	1 year 3 months
48 (H.L.)	34	M	Carcinoma of duodenal papilla with metastasis to mesenteric and pancreatic nodes	Duodenum	Stomach Pancreas and common bile duct	Duodenectomy and gastrectomy—anterior gastrojejunostomy Partial pancreatectomy—pancreatoduodenostomy Resection of common bile duct—cholecystoduodenostomy	Died of bile peritonitis	14 days
49 (S.P.)	66	M	Carcinoma of rectum with direct extension to prostate	Sigmoid colon, rectum, anus	Prostate	Abdominoperineal resection Partial prostatectomy	Alive and well	1 year

TABLE 3 *(Continued)—Multiple Resections for Malignant Lesions*

Case No	Age	Sex	Diagnosis	Viscera Resected Primarily	Viscera Resected Concomitantly	Operative Procedure and Method of Construction	Result	Survival Period
68 (O W)	44	M	Carcinoma of sigmoid colon with extension to abdominal wall and ileum Carcinoma of cecum Carcinoma of ileum with extension to abdominal wall	Sigmoid colon Right colon Ileum	Two segments of anterior abdominal wall	Obstructive resection of sigmoid colon and resection of anterior abdominal wall Resection of ileum—primary end-to-end anastomosis Right hemicolectomy—primary end-to side ileotransverse colostomy Resection of ileum and abdominal wall—end to end anastomosis	Alive and well	12 years 3 months
69 (K M)	52	F	Carcinoma of sigmoid colon Primary carcinoma of ileum Extension on carcinoma of cervical stump omentum and abdominal wall	Sigmoid colon Ileum	Cervical stump Upper vagina Omentum Abdominal wall nodule	Resection of sigmoid colon—primary end to end anastomosis Resection of ileum—primary end-to-end anastomosis Resection of cervical stump and upper vagina Resection of omentum and abdominal wall nodule	Alive and well	7 years 3 months
71 (E P)	27	F	Carcinoma of rectum with extension Metastasis to pelvic viscera Multiple polyposis of colon	Sigmoid colon Anus and rectum	Right and left colon Vagina Uterus Tubes and ovaries	Abdominoperineal resection Resection of posterior vaginal wall Total colectomy—permanent ileostomy with skin graft to ileostomy Total hysterectomy Bilateral salpingo oophorectomy	Alive and well	6 months
74 (H R)	73	M	Carcinoma of uterus (adenocarcinoma of corpus) with direct extension metastasis to urinary bladder urogenital diaphragm and vagina	Uterus tubes and ovaries	Vagina Bladder Urogenital diaphragm Labia minora and majora	Total hysterectomy and bilateral salpingo oophorectomy Resection of vagina and labia Total cystectomy and resection of distal ureters with ileotransverse colostomy and implantation of ureters into distal ileum	Died of renal failure	12 days
77 (I S)	48	F	Carcinoma of right breast with metastasis to thoracolumbar vertebrae and lungs Adenocarcinoma of left ovary with extension to and obstruction of sigmoid colon Carcinoma of left breast	Right breast destroyed elsewhere (cancer paste) Tubes ovaries and uterus	Sigmoid colon Left breast	Total hysterectomy and bilateral salpingo oophorectomy Resection of sigmoid colon—permanent colostomy Left radical mammectomy Massive deep roentgen therapy	Alive and well	6 years

TABLE 3. (*Continued*)—*Multiple Resections for Malignant Lesions*

Case No.	Age	Sex	Diagnosis	Viscera Resected Primarily	Viscera Resected Concomitantly	Operative Procedure and Method of Reconstruction	Result	Survival Period
78(M.G.)	78	F	Carcinoma of gallbladder with metastasis to liver Cholelithiasis	Gallbladder	Liver	Cholecystectomy Resection of liver	Died of recurrence	5 months
79(W.M.)	53	M	Adenocarcinoma of rectum Adenocarcinoma of sigmoid colon Adenocarcinoma of hepatic flexure of colon	Rectum Sigmoid	Right half of colon Distal ileum	Resection of rectum and sigmoid colon with primary end-to-end anastomosis Right hemicolectomy—primary end-to-side eleotransverse colostomy	Alive and well	6 months

Their average survival period is thirty-three months. The average survival period of the 16 patients who died of recurrence or persistence of their original malignant disease was one year.

SUMMARY

Eighty patients requiring multiple visceral resections were studied. Thirty had had two or more viscera removed for benign lesions, with an operative mortality of 6.6 per cent. Twenty-eight of these have survived for an average period of three years.

Fifty patients with advanced abdominal malignant disease required the removal of two to seven viscera or portions of viscera in the attempted eradication of their disease. Nine died within the first three weeks, constituting an operative mortality rate of 18 per cent. Sixteen patients died of recurrence of malignant disease after an average period of one year. The remaining 25 are alive and well, with an average survival period of thirty-three months.

CONCLUSIONS

The patient with extensive and advanced abdominal malignant disease must accept the proportionately greater operative hazard involved in radical attempts toward complete removal of the neoplasm. The surgeon must also face this unflinchingly. If he does, his "crutch" of inoperability will be leaned upon less frequently, and his reward will be an ever-increasing aggregate of patients whom he has helped to guide from the umbra of despair.

RÉSUMÉ ET CONCLUSIONS

On rapporte ici 80 cas de résections multiples de viscères. De ce nombre, 30 patients eurent deux organes ou plus de réséqués pour des lésions bénignes avec un taux de mortalité opératoire de 6.6%. 28 cas ont survécu 3 ans. 50 patients qui présentaient des lésions malignes très avancées eurent entre deux et sept viscères d'enlevés. Il y eut 9 mortalités durant les 3 premières semaines, donnant

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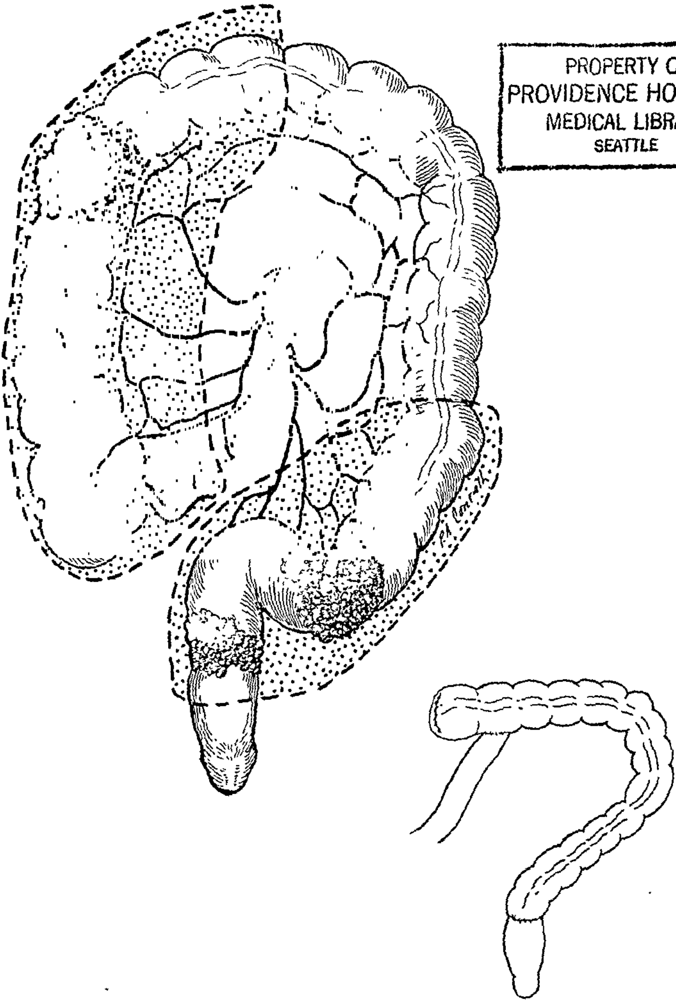

Fig. 6 (*Case 79*).—W.M. Adenocarcinoma of the rectum, adenocarcinoma of the colon, adenocarcinoma of the hepatic flexure of the colon—three primary lesions—occurring in the same patient and discovered at operation. Dotted lines indicate viscera resected. Right hemicolectomy, resection of the sigmoid colon and rectum. Ileotransverse colostomy and primary end-to-end anastomosis of descending colon and rectum. Single one-stage procedure.

alors un taux de mortalité de 18%. Il y eut 16 autres décès par récidive après une année. Les 25 autres vivent encore et se portent bien, donnant ainsi une moyenne de survie de 33 mois.

Les patients qui présentent une atteinte cancéreuse abdominale avancée présentent aussi un risque opératoire plus grand, si le chirurgien envisage l'éradication complète de la néoplasie. Le chirurgien ne doit pas flancher en face de cette obligation.

RESUMEN Y CONCLUSIONES

Se estudian 80 pacientes que requirieron resecciones viscerales múltiples. En 30 se extirparon dos o más vísceras por lesiones benignas, con mortalidad de 6.6%, habiendo sobrevivido 28 de estos un promedio de 3 años. En 50 pacientes con lesiones malignas abdominales avanzadas se extirparon de dos a siete vísceras o porciones de víscera en al intento de erradicar su enfermedad, habiendo muerto 9 en las primeras tres semanas, con mortalidad operatoria del 18%, y 16 por recidiva después de 1 año aproximadamente. Los 25 restantes se encuentran vivos y bien, con un promedio de supervivencia de 33 meses.

RIASSUNTO E CONCLUSIONI

Ottanta pazienti richiedendo risezioni multipli viscerale furono studiati. Trenta hanno avuto rimosso due o piu' viscere a causa di lesioni benigni, con martalita' di 6.6 percento. Ventotto di questi hanno sopravissuto un termine di tre anni. Cinquanta pazienti con malattia addominale maligna avanzata avevano bisogno di rimovimento da due a sette viscere o porzioni di viscere nel attantato sradicamento di loro malattia. Nove morirono dentro dei primi tre settimane, costituendo un rango di mortalita' operatoria di 18 per cento. Sedici pazienti morirono di recidivo della malattia maligna dopo un periodo termine di un anno. I rimanente 25 sono vivente e bene, con sopravvivenza di trentatre mesi.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Achtzig Patienten, bei denen mehrfache Organresektionen noetig waren, wurden untersucht. An dreissig von diesen waren zwei oder mehr Organe wegen gutartiger Erkrankungen vorgenommen worden, und die Operationssterblichkeit betrug 6,6%. Achtundzwanzig von diesen sind nach durchschnittlich drei Jahren noch am Leben. Bei fuenfzig Kranken mit vorgeschrittenen boesartigen Baucherkrankungen erforderte der Versuch, das Leiden auszurotten, die Entfernung von zwei bis sieben Organen oder Organteilen. Neun Kranke starben innnerhalb der ersten drei Wochen und brachten die Operationssterblichkeit auf eine Quote von 18%. Sechzehn Kranke starben innerhalb durchschnittlich eines Jahres an einen Rueckfall der boesartigen Erkrankung. Die uebrigen fuenfundzwanzig sind nach durchschnittlich etwa dreiunddreissig Monaten wohlauf. Kranke mit augsgedehnten und vorgeschrittenen boesartigen Bauchleiden muessen ein durch den radikalem Versuch einer vollstaendigen Entfernung der Geschwulst bedingtes verhaeltnismaessig groesseres Operationsrisiko auf sich nehmen. Auch der Chirurg muss dieser Tatsache unerschrocken ins Auge sehen.

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The Diagnosis and Surgical Treatment of Cervical Lesions of the Intervertebral Disc

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PAIN in the shoulder and arm occurs with considerable frequency and may attain a distressing significance. In the past this common syndrome was erroneously ascribed to brachial neuritis, cervical rib, scalenus anticus syndrome, arthritis, bursitis, myositis, fibrosis and other conditions. Since its actual pathologic background was poorly understood, the differential diagnosis was in a state of confusion.

In recent years, however, surgeons have come to realize that the most common cause of pain in the shoulder and arm is irritation of a cervical nerve root by a lesion of the intervertebral disc. Some other conditions do occur, but careful consideration of the underlying pathologic disturbance should aid in making a proper diagnosis. Professional knowledge of cervical lesions of the intervertebral disc has been built upon experience gained from correlating clinical signs and symptoms with operative observations and by studying the effects of surgical intervention.

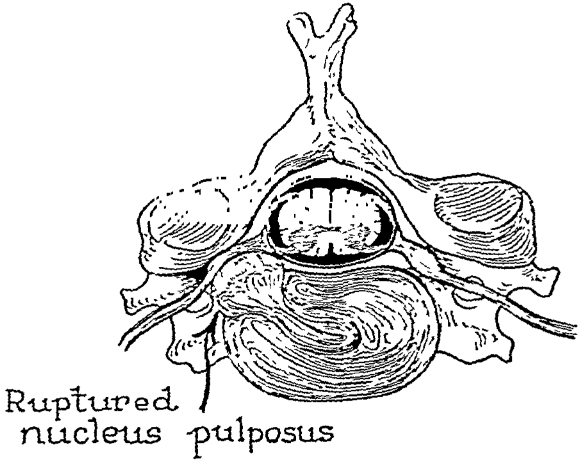

Fig. 1.—Nerve root compression by a ruptured intervertebral disc is shown. On the opposite side the normal relationship of the nerve root is illustrated. (Redrawn after Spurling.)

Interest in the significance of intervertebral disc lesions in the lumbar region was stimulated by a paper by Mixter and Barr[1] in 1933. In succeeding years it gradually became known that the most common cause of low back pain and sciatic

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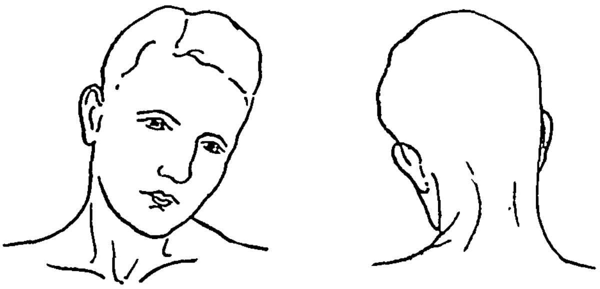

Fig. 2.—Sketch drawn from a patient with painful limitation of motion and a list caused by marked compression of a cervical nerve root.

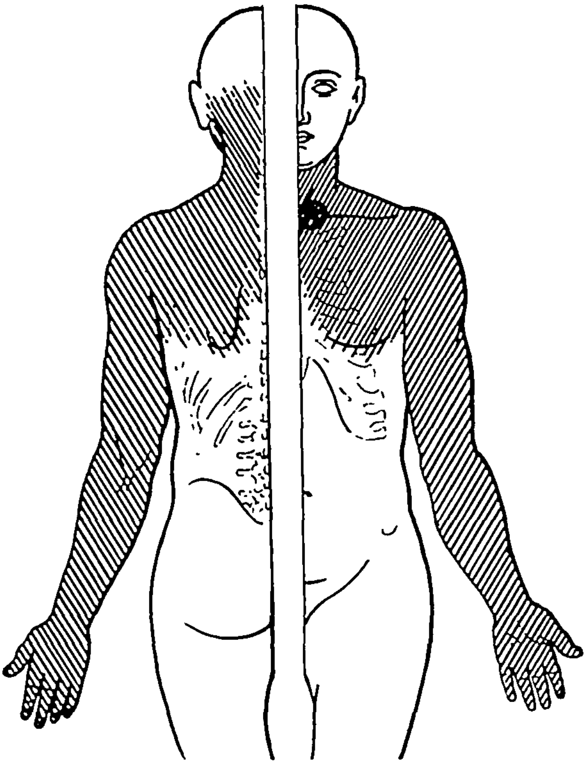

Fig. 3.—Sketch showing entire region (shaded area) where pain may occur from a cervical nerve root lesion. The small circle marks the place where tenderness is often located.

pain was a lesion of an intervertebral disc in the lumbar region. The various types of pathologic lesions of the lumbar discs and the manner in which they produce pain are now well known.

That entirely analogous lesions occur in the cervical region with perhaps equal frequency and also cause distressing pain has come to be known somewhat recently. That it took so many years for this truth to be appreciated is, to say the least, embarrassing. Nowadays, with hindsight on our side, we can look back with chagrin because we did not deduce long before what now appears entirely logical. Even though some of us have been enlightened, we are experiencing again the slow dissemination and slow acceptance of medical progress.

Since the disorder is a very common one and also one in which the symptoms have been for so long erroneously ascribed to various other causes, it seemed fitting to examine this timely subject. Treatment of these disorders has been vastly improved as a result of better understanding of the problem.

As the cervical nerve root leaves the spinal canal, it passes between the disc and the adjacent articular process. It is here that the nerve root is crowded and is frequently subjected to physical irritation by minor changes in structure. This space constitutes the anteroposterior diameter of the intervertebral foramen, and, even in the normal structure, it is scarcely larger than the diameter of the nerve root. When disc material becomes extruded into this space or when hypertrophic marginal disc changes develop the nerve root becomes crowded and occasionally tightly compressed.

A large protrusion may also encroach upon the spinal cord and cause paralysis. Since the neurologic manifestations of spinal cord involvement are apparent, there is little difficulty in recognizing the nature of this disorder. This more serious form of cervical disc protrusion will not be considered further in this presentation.

The common pathologic changes affecting the intervertebral discs are well known, and, by deduction, conclusions have been reached as to how these changes come about. A fair understanding of the mechanism by which the symptoms and objective observations are produced has also been gained.

It seems likely that the common pathologic changes occurring in the intervertebral discs result from injury to the discs,

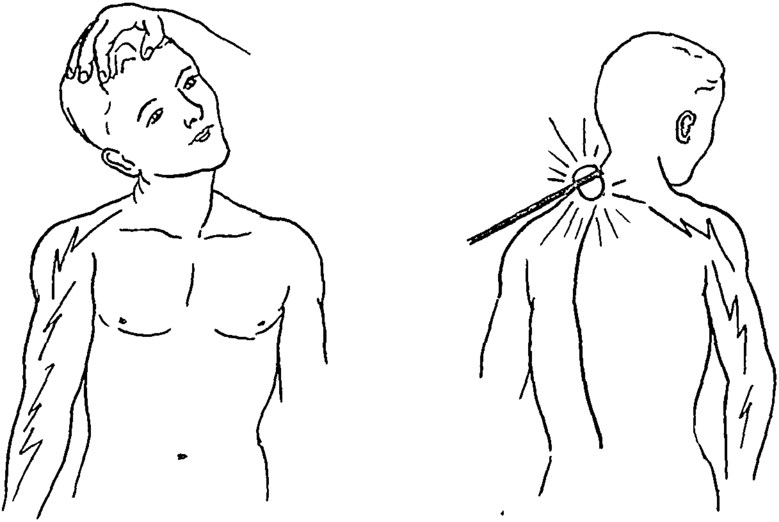

Fig 4—Pain or paresthesias may be reproduced by the head compression test or by percussion over the spine (Redrawn after Spurling)

either by direct violence or by damage incident to wear and tear, but metabolic or hormonal disturbances or other dysfunctions may play a part in rendering the disc more susceptible to injury That the disc is initially torn so that its integrity as a supporting and joining structure is disrupted appears probable Increased mobility between the two adjacent vertebrae results, placing added strain on the intact supporting tissues in the region This disturbance is probably responsible for the local pain and tenderness in the neck, which tends to diminish as the tissues recover from the initial injury and the reparative processes add support to the injured region

The nerve root pain results from direct irritation, is characteristically referred to the scapular and shoulder regions and may extend into the arm and distally

The diagnosis of nerve root compression by a lesion of the intervertebral disc is not difficult, because the location of the pain in the shoulder and the manner in which it is described are nearly always the same The pain is often aggravated by movements of the neck and arm

There is often no history of injury When an injury has occurred, it has usually caused a sudden jerking of the neck Automobile collisions involving sudden starts or stops often jerk the neck and cause such an injury

Hypertrophic changes about the disc can exist without causing any symptoms until some relatively minor jerk on the neck initiates acute pain

If numbness or paresthesia occurs in certain fingers, the diagnosis is almost certain Spurling[2] has pointed out that pain and paresthesias may often be reproduced by compression of the head onto the neck with the head tilted The location

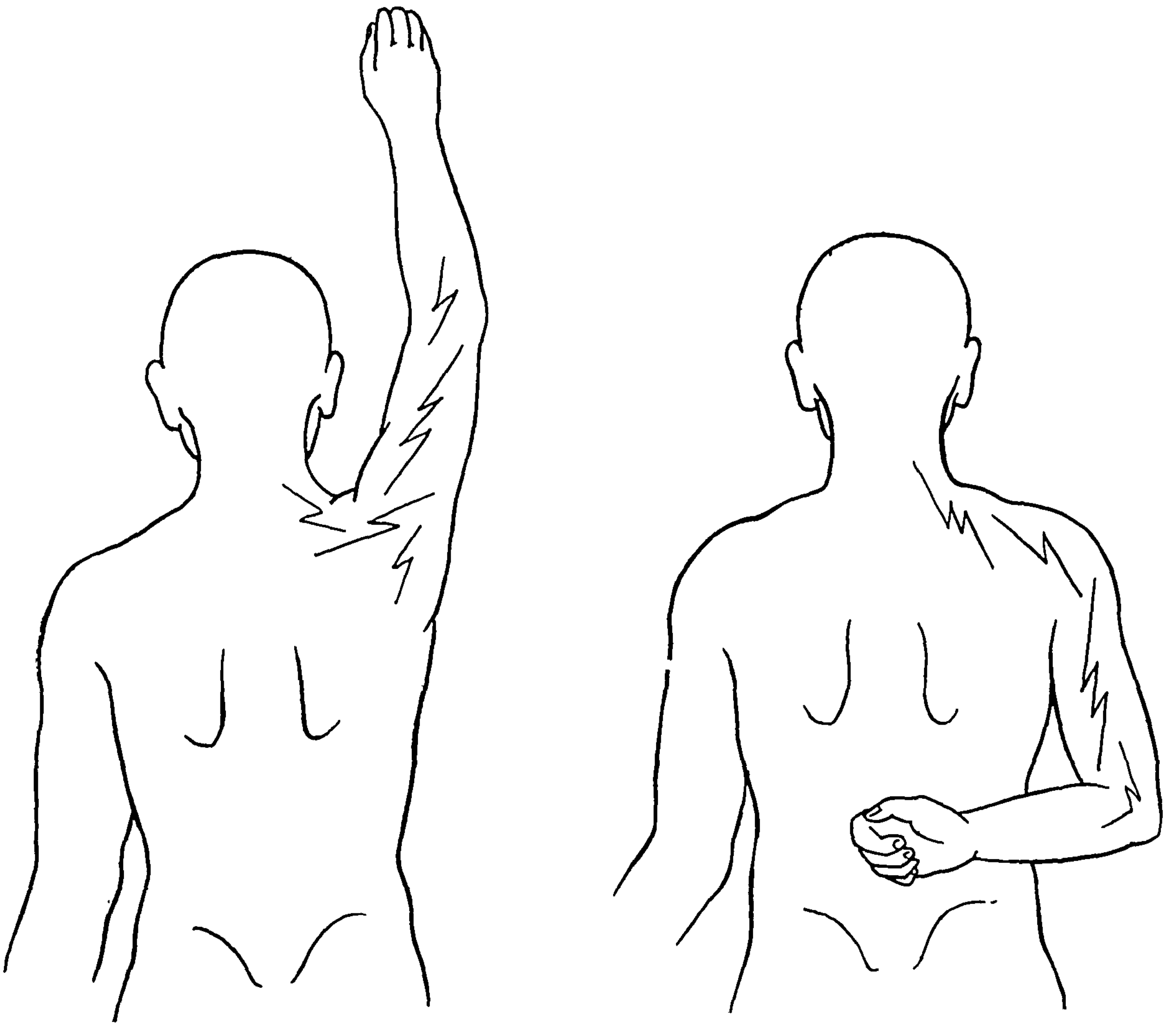

Fig. 5.—Pain or paresthesias may also be reproduced by certain positions of the extremity as illustrated.

of any numbness or paresthesia aids in determining which root is affected. In general, the sixth cervical root innervates the thumb; the seventh, the forefinger and the middle finger; and the eighth, the ring finger and the little finger. Reflex alterations, which add a clue to the localization, may also be noted. The biceps reflex may be diminished or absent when the sixth nerve root is damaged, and the triceps reflex may be altered in a lesion of the seventh nerve root.

Roentgenograms of the cervical portion of the spine are sometimes helpful, but they may appear entirely normal. The abnormalities most frequently observed are diminution of the normal cervical lordosis and narrowing of the disc space. When the lesion is of long standing, hypertrophic marginal changes may be seen. These are the changes which have been noted so frequently in roentgenograms of the spine and which have been referred to so commonly as "osteoarthritis." Views taken obliquely through the long axis of the intervertebral foramen may show encroachment into it by hypertrophic changes of the disc.

Cervical myelographic study may be very helpful, but this procedure has dis-

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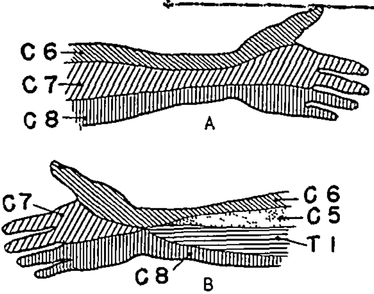

Fig. 6.—Sensory chart showing dermatomes (Redrawn after Keegan[1])

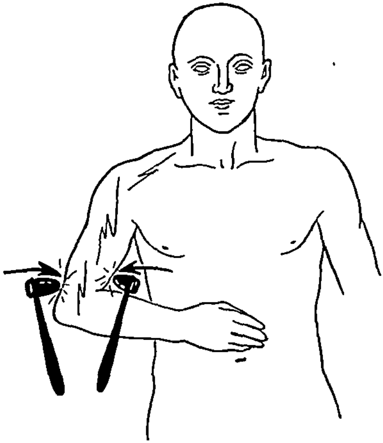

Fig. 7.—The biceps reflex is often absent or diminished in a lesion of the sixth cervical root while the triceps reflex may be altered in a lesion of the seventh cervical nerve root.

advantages and should be used only when a localized diagnosis cannot be made by other means.

Initial treatment should be conservative, since the pain usually subsides within a few days. Though cervical traction may be helpful, it is often disappointing and may even increase the pain. Immobilization of both the arm and the neck is important. Symptomatic relief of pain may be obtained by analgesics and heat therapy. Any form of manipulative treatment may increase the pain and is potentially dangerous.

If the pain is severe and prolonged, surgical intervention may be required to relieve it. The operative technic has been greatly simplified of late, and the procedure has now come to be a relatively easy one. The laminae are exposed; a dental drill is used to remove the bone over the nerve root, and any disc material which is crowding the root is removed. In certain patients, satisfactory results have been obtained by simply dividing the sensory portion of the root. The osseous opening required to expose the nerve root need

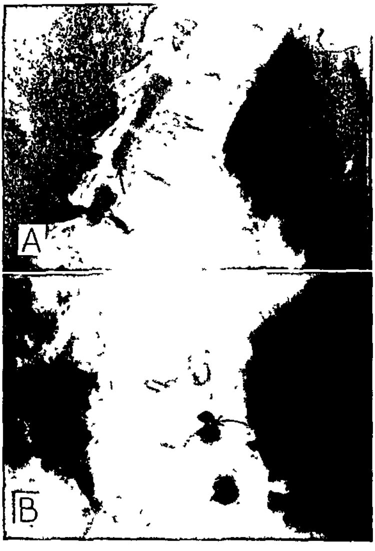

Fig. 8.—*A*, view taken obliquely, showing proliferative change crowding the intervertebral foramen. At operation the sixth nerve root was found to be tightly compressed. *B*, the spur projecting into the intervetebral foramen was squeezing the seventh nerve root.

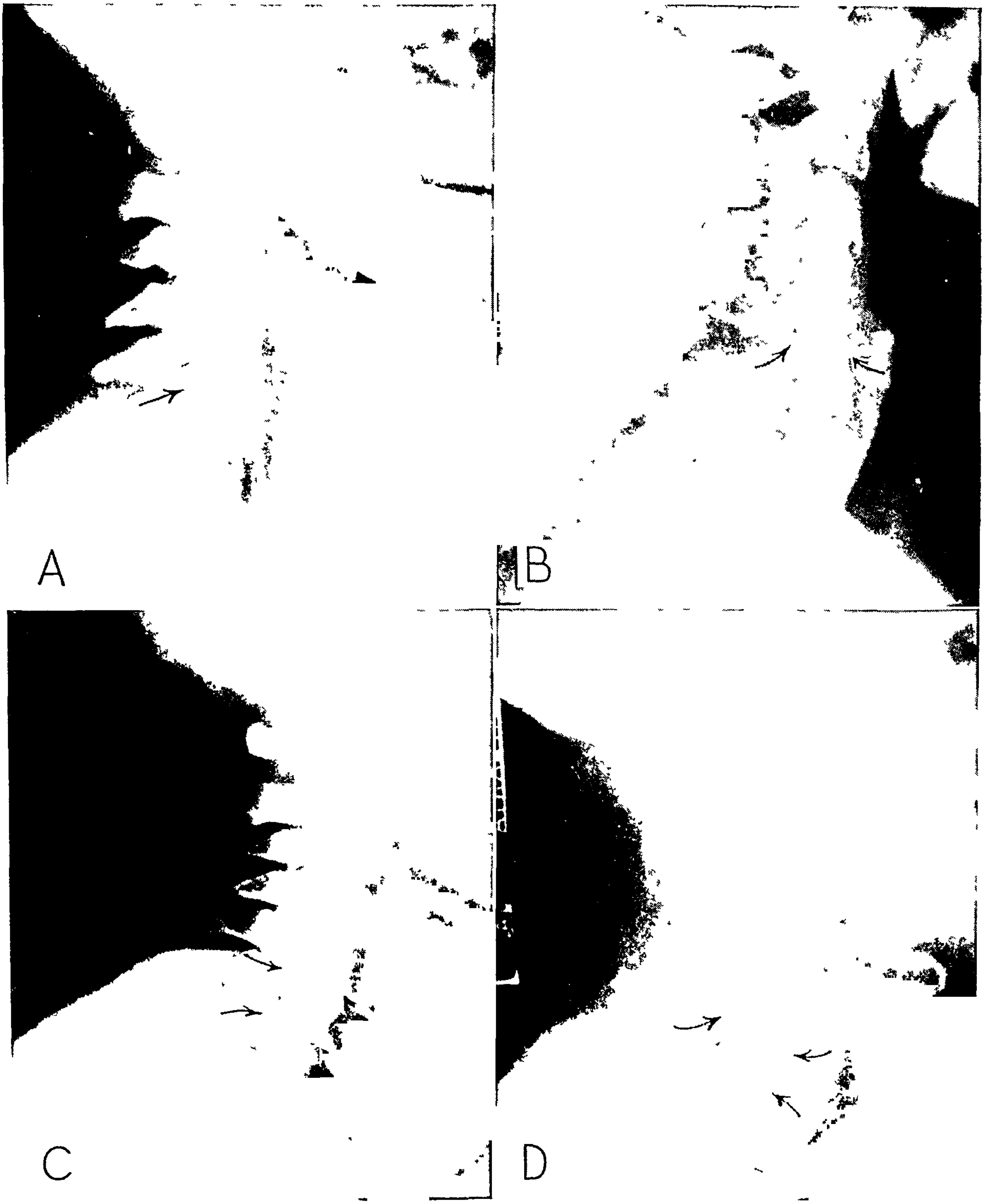

Fig. 9.—In *A*, the arrow indicates the level of the ruptured disc verified by operation. Note the reversal of the normal cervical lordosis. In *B*, note the loss of the normal curvature and the early hypertrophic changes about the disc between the fifth and sixth cervical vertebrae. In *C*, typical changes are shown which compressed the sixth and seventh cervical nerve roots. Both lesions were verified surgically. In *D*, the space between the fifth and sixth bodies is narrowed and the proliferative reaction is marked. The disc below also shows some changes.

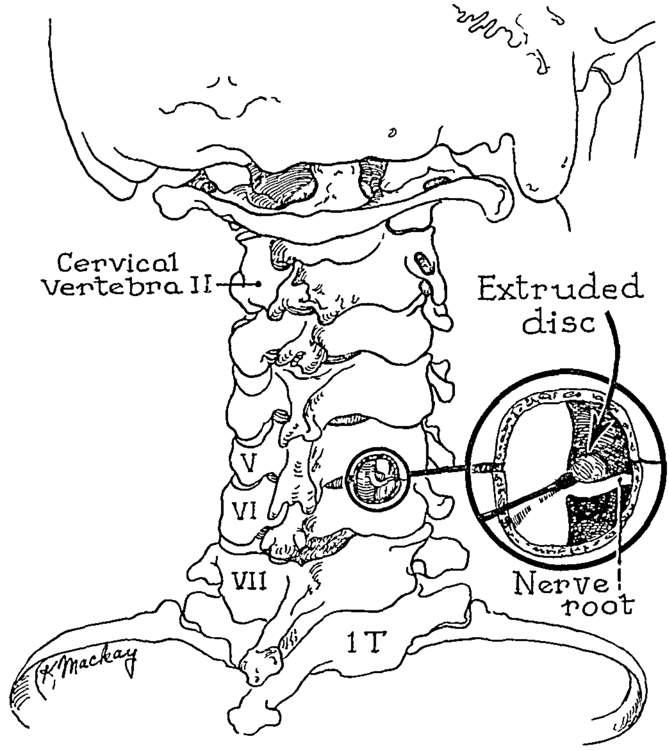

Fig 10—Dorsal view of cervical portion of spine, showing area of bone removal to expose the nerve root In the enlarged area the nerve root is retracted to expose the herniated disc

not be more than 1 cm in diameter Since this limited removal of bone causes no weakness of the spine, the patient can become ambulatory whenever he wishes In general, the relief of pain has been quite satisfactory

The severe pain is almost invariably relieved immediately after the operation, and the milder pain may be expected to subside gradually

SUMMARY

The most common cause of shoulder and arm pain is the compression of a cervical nerve root by a lesion of the intervertebral disc A diagnosis can be made with a high degree of accuracy

Pain caused by compression of the cervical root usually subsides within a few days when treated conservatively. If the

pain is persistent and severe, however, surgical decompression of the nerve root is indicated. This is a relatively simple procedure, and the results obtained are excellent.

RÉSUMÉ

La cause la plus fréquente de douleur à l'èpaule et au bras est la compression de la racine cervicale d'un nerf secondaire à une lésion du disque intervertébral. Le diagnostic est des plus faciles à faire.

La douleur secondaire à une compression d'une racine cervicale rétrocède après quelques jours de traitement. Toutefois dans les cas de persistance de la douleur, il faut recourir à la décompression chirurgicale. Le procédé est simple et donne d'excellents résultats.

RESUMEN

La causa más común del dolor de hombro y brazo es la compresión de una raíz nerviosa cervical por una lesión del disco intervertebral. Puede diagnosticarse con gran exactitud.

El dolor causado por la compresión de la raíz cervical subsiste ordinariamente por varios días cuando se le trata conservadoramente. Sin embargo, si el dolor es persistente y severo se encuentra indicada la descompresión quirúrgica de la raíz nerviosa. Este es un procedimiento relativamente simple y los resultados que se obtienen son excelentes.

RIASSUNTO

La causa piu comune di dolore della spalla e del braccio e' compressione d'una radice del nervo cervicale da una lesione del disco intervertebrale. Una diagnosi si puo' fare con un alto grado di esatezza.

Dolore causato da compressione della redice cervicale ordinariamente e' placabile dentro di pochi giorni sotto il trattamento conservatismo. Se il dolore sia persistente e severo, intanto, decompressione chirurgica della radice del nervo sia indicata. Questa e' un procedimento relativamente semplice, ed i risultati ottenuti sono eccellenti.

ZUSAMMENFASSUNG

Die haeufigste Ursache von Schulter— und Armschmerzen bildet der durch die Verletzung einer Zwischenwirbelscheibe hervorgerufene Druck auf eine Halsnervenwurzel. Die Diagnose kann mit einem hohen Grade von Genauigkeit gestellt werden.

Der durch Druck auf die Halsnervenwurzel entstehende Schmerz verschwindet gewoehnlich in wenigen Tagen unter konservativer Behandlung. Ist der Schmerz aber bestaendig und heftig, so ist die chirurgische Entlastung der Nervenwurzel angezeigt. Dies ist ein verhaeltnismaessig einfaches Verfahren, und die erzielten Ergebnisse sind ausgezeichnet.

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The Exclusion Resection (Finsterer) for Nonresectable Duodenal Ulcers

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THE percentage of nonresectable duodenal ulcers reported by different authors ranges from 3 to 80; in general it has been eventually reduced. Our own figure in 1936 was 50 per cent and now is approximately 5 per cent.

In 1918 Finsterer[1] recommended his exclusion resection for these cases: a subtotal gastrectomy (Hofmeister-Finsterer) with closure oral to the ulcer. Originally he performed either a prepyloric closure, with or without removal of the mucosa, or a postpyloric closure; later, only the prepyloric transection with excision of the mucous membrane.

Technic. — The postpyloric closure, which was last described in 1942 by McNealy,[2] is theoretically sound as far as the prevention of marginal ulcers is concerned. However, it is never necessary and should be abandoned, as it is too dangerous (Table 1).

The standard procedure should be the prepyloric closure of the antrum with removal of the mucous membrane. The methods of Finsterer,[3] Wilmanns,[4] Druener,[5] Bancroft,[6] Buerkle de la Camp, Fischer,[8] Fromme,[9] Spak,[10] Wangensteen[11] and Plenk[12] are very similar, differing only as to details concerning the length of the cuff and the suturing. In cases of doubtfully resectable ulcers we divide the sufficiently mobilized stomach between two clamps 5 cm. from the pylorus, the blood supply of the antrum having been left intact. Only then do we decide whether a resection or an exclusion operation should be performed, both procedures being facilitated (Fig. 1).

Anastomosis.—Finsterer[11] has emphasized the importance of doing a retrocolic, no loop, partial inferior gastrojejunostomy. We have also had good results with other types of anastomosis, with the exception of the antecolic, long loop gastrojejunostomy with an enteroanastomosis.

Altogether different methods of dealing with nonresectable duodenal ulcers were described by Jacobovici[14] and Foeldessy,[15] the latter's procedure being a gastroenterostomy for exclusion. They have not found acceptance.

Mortality.—Our statistics on exclusion resections of various authors between 1918 and 1950, including prepyloric and postpyloric transections, shows a mortality rate of 5 per cent.

It should be kept in mind that 5 per cent is the assumed average mortality of the resection and that, for obvious reasons, the more difficult cases were selected for the exclusion operation. The mortality rate, however, is much lower if only the prepyloric exclusion operations are considered and if reduced to complications caused by the remaining ulcer or leakage from the stump (Table 1). With a single exception, the reduced mortality rates, if mentioned, range from 0.4 to 2.6 per cent.

Our own statistic (1930-1950) includes 264 prepyloric exclusion operations with 4 deaths (1.9 per cent) and 2 postpyloric exclusion resections with no death. The reduced mortality is 1 case (0.4 per cent).

The reduced mortality rates would surely be lower yet if they did not include cases in which the decision to perform an exclusion operation was made after an attempt to resect radically (as is specifically mentioned by Spak[10]). Most authors do not mention these cases, but in our opinion a reduced mortality rate much higher than 2 per cent (for instance, one

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statistic with a rate of 7-8 per cent), can be attributed to this cause.

Morbidity.—Some authors (e.g., Lewisohn[16]) consider the morbidity of this operation higher than that of radical resection, owing to leakage from the stump or complications from the ulcer, such as hemorrhage or perforation. This is surely not true for our cases. We encountered no hemorrhage and 2 nonfatal fistulas. The rare occurrence of hemorrhage is also emphasized by most authors. The exclusion operation should not be used for bleeding ulcers.

Marginal Ulcer.—That exclusion resection with removal of the antral mucous membrane is free from objections has been made probable by the experiments of Lannin[17] and Zuckschwerdt and Becker.[18] Fauley, Strauss and Ivy,[19] who noted a high percentage of marginal ulcers in their experiments with the Finsterer operation, seem to have left the mucosa of the antrum behind. That exclusion resections are not followed by marginal ulcers more frequently than radical resections may be proved by statistics; one should keep in mind that the latter have an incidence of marginal ulcers of about 2-6 per cent.

We have compiled a statistic on marginal ulcers from a total of 1,810 prepyloric exclusion resections. Some authors do not state their late results; in several instances, otherwise very valuable statistics could not be used because they do not give the results of prepyloric and postpyloric exclusion operations separately. Our statistic is therefore based on 1,040 selected cases of antral exclusion resection.

We consider the results of those cases in which the antral mucosa was removed very satisfactory. The value of excising the mucous membrane has been emphasized by Ogilvie,[20] Steinberg,[21] and Allen and Welch,[22] who had series of cases with the mucosa left in and with the mucosa removed. They found a very high incidence of marginal ulcers in the first and a very low incidence or none in the second series.

Late Hemorrhage.—We could not find a report of a late hemorrhage which could be attributed to the remaining ulcer and

TABLE 1.—*Mortality of Exclusion Resection: A Comparison of Prepyloric and Postpyloric Exclusion Operations**

	Number of Cases	Mortality		Reduced Mortality (Perforation, hemorrhage, leakage from stump)	
		Number	%	Number	%
Prepyloric exclusion resections	1,614	70	4 3	22—25 (of 1,349 cases)	1 6—1 9
Postpyloric exclusion resections	255	29	11 4	9 (of 96 cases)	9 4

*Compiled from statistics published between 1926 and 1950

TABLE 2.—*Mortality of the Exclusion Resection (Prepyloric and Postpyloric)**

	Number of cases	Mortality	
		Number of cases	%
Zuckschwerdt and Horstmann (compiled from literature, 1918-1936)	1,834	98	5 3
Statistic compiled from literature (1926-1950) and including our own cases	2,043	106	5 2
Sum (cases included in both statistics subtracted)	3.582	183	5 1

*Compiled from the literature (1918-1950).

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TABLE 3—*Incidence of Marginal Ulcers After Prepyloric Exclusion Resection*

	Total Number of cases	Marginal Ulcers
	1040 47 752	48—52=4 6—5 0% 13=27 7% 7—9=0 9—1 2%

TABLE 4—*Prepyloric Exclusion Resections*

Total Number of Cases	Cured		Improved	Marginal Ulcers
	Excellent	Good		
158	126=79 7% 146=92 4%	20=12 7%	5=3 2%	6 (reoperated) 1 (x-ray) 7=4 4%

TABLE 5—*Data on Resections for All Types of Ulcer*

	Billroth II		Billroth I		Sum	
	Number	Mortality Rate	Number	Mortality Rate	Number	Mortality Rate
Noncomplicated ulcer Callous gastric ulcer Callous duodenal ulcer	1 505	1 4%	195	0 5%	1 700	1 2%
Complicated ulcer Gastric and duodenal ulcer marginal ulcer perforated ulcer acutely bleeding ulcer	287	5 9%	13	6 5%	300	6 3%
	1 792	2 1%	208	1 4%	2 000	2 0%

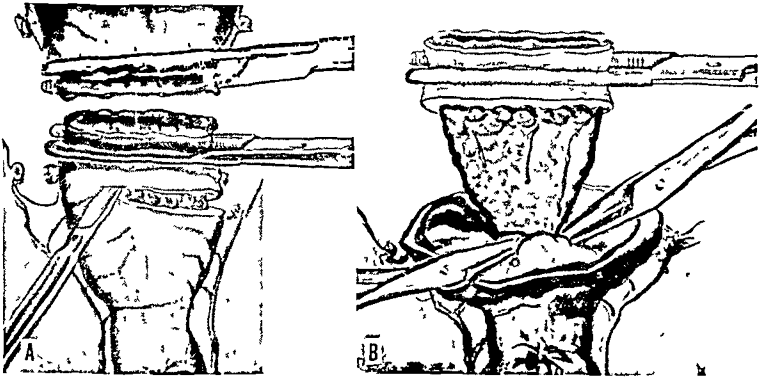

Fig 1—Author's technic *A*, mobilized stomach divided between clamps (see text) *B*, excision of mucous membrane

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Splanchnicotomy for Prevention and Treatment of Urologic Disturbances in Diseases of the Spinal Cord

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THE majority of patients suffering from transverse myelitis eventually succumb to secondary renal damage eventuating in urosepsis as a result of pyelonephritis with or without urolithiasis; this because the disease is regarded as incurable and a fatal course is inevitable. In many cases, however, new conceptions concerning the formation of urinary calculi, as well as the development of new surgical methods, provide the possibility of controlling disturbances of the kidneys and urinary bladder associated with lesions of the spinal cord, and at least one is able to alleviate the suffering of the patients and to prolong the lives of a number of them.

The usual disturbances of the urinary bladder in these cases may be classified into three types. In Type 1, spinal cord lesions situated above the sacral segments produce the clinical picture of the so-called "*reflex bladder*." Micturition is involuntary but complete; no residual urine remains; therefore, catheterization becomes superfluous after the primary shock of the injury has subsided. In Type 2 the vesical disturbances producing the clinical picture are those of an *autonomous* and an *atonic* bladder and are due to lesions of the second to fourth sacral segments or the corresponding spinal nerve roots. In either case permanent catheterization is required because of the large amount of residual urine. Considering these circumstances, it seems astonishing that lesions of the spinal cord associated with fractures and dislocations of the eleventh thoracic to the second lumbar vertebra, as most frequently observed by the surgeon in times of peace, produce paralysis of the urinary bladder instead of a "*reflex bladder*," since the nervous damage originates considerably above the sacral segments. One must realize, however, that the paralysis here is the result of a combination of lesions of the spinal cord and its roots. In addition, the relation of the spinal cord and its roots to the vertebral bodies must be considered, and it should

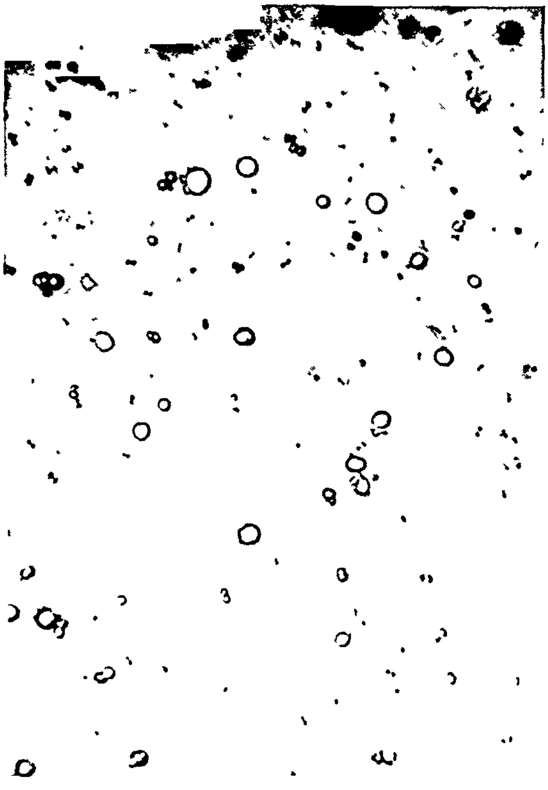

Fig. 1.—Urinary sediment ten minutes after peroral administration of oxamid (rat). Observe numerous colloidal bodies in the urine. × 300.

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be remembered that all of the five sacral segments are located in the area of the twelfth thoracic vertebral body. Therefore, if this or one of the adjoining vertebra is injured the result will be, on the one hand, paralysis of the bladder caused by the injury to the vesical center located in the sacral region, and, on the other hand interruption (due to the lesion) of the nerve supply to the spinal cord roots situated in cord segments at a higher level.

[illegible] experiences have again corroborated the observation that lesions to the spinal cord associated with interruption of the ninth dorsal to the first lumbar roots will lead to the formation of renal stones almost without exception. On the other hand, lesions located above the second thoracic segment, as well as those below the second lumbar segment, very rarely cause the development of renal

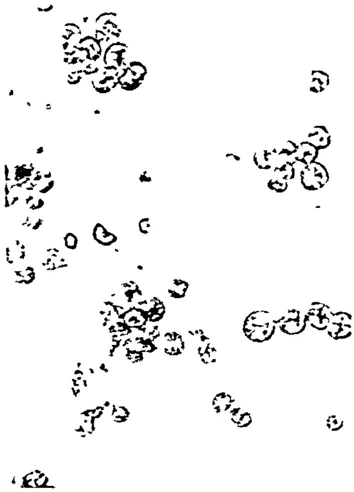

Fig. 2.—Ten minutes later. One may now observe secretion of spharoliths. × 300.

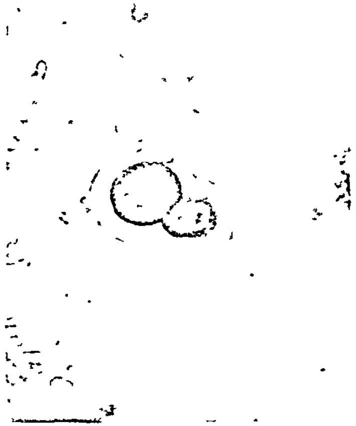

Fig. 3—Urinary sediment in the rat after feeding with oxamid. Observe synthetic microlith with colloid capsule. 300.

calculi. I have tried to explain this fact in a previous publication, and my theory of the formation of urinary concretions is based upon that paper. It is my impression that any formation of urinary calculi is the result of circulatory renal disturbances, which in turn are the result of a pathologic state of hyperstimulation of the splanchnic nerve. Although the ordinary predominance of the splanchnic nerve associated with spinal cord lesions between the ninth thoracic and the first lumbar segment is a well known fact, only the development of a *pathologic stimulation* of this nerve produces the disturbance of the renal blood supply and consequently the formation of calculi.

Should a latent stage of stimulation on the basis of a focal infection exist at the time of injury, the mere stimulus of the trauma may change the latent condition

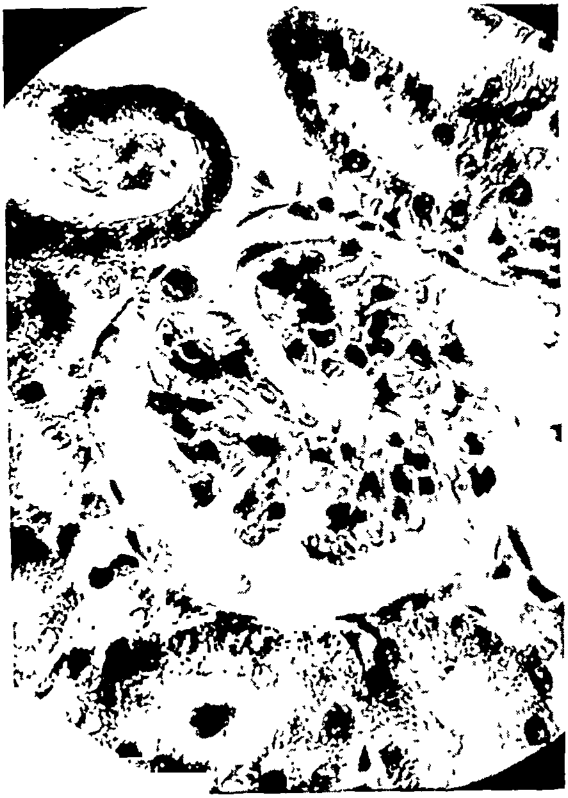

Fig. 4.—Kidney of rat. Glomerulus showing colloid concretion in Bowman's capsule. Cloudy swelling and accumulation of albumin droplets in the main section. × 500.

into an active one. In the majority of cases, however, such stimulation is produced by the renal infection that results from the bladder paralysis and as a result of permanent catheterization. The infection acts via a vaccination-sensitization mechanism on the splanchnic nerve, particularly since this nerve is in absolute control of renal function. The cause of renal stone formation in spinal cord injuries between D-9 and L-2 is therefore to be looked upon as a disturbance of balance of the renal nerve supply in connection with the renal infection.

Thus it becomes clear what path we have to follow in order to prevent a disturbance of the uropoietic system as a result of lesions of the spinal cord. In damage to the spinal cord between D-9 and L-2, not only is the influence of the splanchnic nerve to be eliminated but an ascending infection must be prevented. In damage to the cord below L-2 down to S-4, which in spite of associated pyelonephritis is relatively seldom followed by nephrolithiasis, one may be satisfied with prevention of an infection. The prevention of infection, however, requires the liberation of the patient from the catheter, i.e., restitution of the ability to urinate, because every permanent catheterization will eventually produce a vesical infection which, with the existing atony of the ureters, will invariably cause ascending pyelonephritis.

Until now all interventions on the autonomic nervous system have been unsuccessful. They have failed to restore the power of spontaneous micturition. Rocher's operation, however, is able to accomplish this by a simple and easily executed procedure that does not impose too much discomfort upon the patient. It consists in suturing a taut piece of rectus muscle to the anterior wall of the bladder. Since the rectus muscle receives its nerve supply from the fifth to the twelfth dorsal segments, the operation may always be performed in cases of paralysis of the bladder. Therefore the principle of Rocher's procedure is based on the conception of furnishing the bladder with a nerve supply. The effect of the operation, however, becomes manifest within a few days; therefore it seems probable that contraction of the detrusor muscle is accomplished through the mechanical pull of the rectus muscle graft. It produces a stimulation of the intramural nerve plexus in the bladder, whence the detrusor receives its impulses. The elevation of the pelvic floor by the taut pull of the rectus muscle plays a contributory role.

This simple operation was rediscovered by Boeminghaus and was followed by immediate success in 4 out of 5 cases in which I operated. Three patients, each with an autonomous bladder resulting from a spinal cord injury, and 1 patient with a corresponding bladder disturbance resulting from a myelocystocele were able to empty the bladder spontaneously and completely on the fifth day after the operation—that is, immediately after removal of the catheter. The failure of the operation on the fifth patient, who also had paralysis of the bladder following a spinal cord injury, in my opinion, was due to insufficient tension of the rectus traction during the operation. Two additional operations performed by May [Munich] were also successful.

It need not be emphasized what this operation affords to the patient both physically and psychologically. As has been mentioned, in cases of spinal cord injury associated with the loss of nerve supply from the ninth dorsal to the second lumbar segment, it is necessary to eliminate simultaneously the splanchnic nerve in order to prevent stone formation. The kidney will be freed from the influence of the splanchnic nerve, so that stages of stimulation cannot develop or become effective. The resulting improvement of the renal blood circulation also counteracts the development of severe pyelonephritis. This operation is accompanied by marked shock to patients who suffer from injury, not to speak of the fact that the damage suffered by the vertebra will not permit the positioning of the patient that is necessary for resection of the splanchnic nerve. However, the transthoracic severing of the splanchnic nerve with the aid of the thoracoscope, as described by Kux [Innsbruck], or the exeresis of the nerve by the same procedure, as described by Picard [Cairo], provide methods which may well be undergone even by these enfeebled patients. I should like to recommend this simple procedure warmly. It is important, however, that the splanchnicotomy, as well as Rocher's operation, be resorted to soon after the injury, before a major infection has set in. Conservative treatment seems to me to be outmoded. One should not condemn the patient to decrepitude as long as there is a possibility of helping him and preventing major damage and other complications. This procedure seems to offer the best possibility of both.

SUMMARY

1. Types of so-called "cord bladder" are discussed.

2. The advantages of Rocher's operation are pointed out.

3. To avoid stone formation, a splanchnicotomy with a thoracoscope after Kux or Picard is recommended.

RÉSUMÉ

1. On y discute différents types de "cord bladder".

2. On recommande les avantages de l'opération dite de Rocher.

3. Pour prévenir la lithiase, à l'aide du thorascope, on pratique une résection du splanchnique selon la méthode Kux ou Picard.

RESUMEN

1. Se discuten los tipos de la llamada —cord bladder—.

2. Se puntualizan las ventajas de la operación de Rocher.

3. Se recomienda una esplacnicotomía con toracoscopio, según Kux o Picard, para evitar la formación de piedra.

ZUSAMMENFASSUNG

1. Es werden verschieden Typen der sogenannten "Rueckenmarksblase" eroertert.

2. Die Vorzuege der Rocherschen Operation werden dargestellt.

3. Zur Vermeidung von Harnsteinbildungen wird die Splanchnikusdurchschneidung mit Hilfe eines Thorakoskops nach Kux oder Picard empfohlen.

RIASSUNTO

1. Discute tipi cosi' detto "vescica neurologica".

2. Gl 'avvantaggi del operazione Rocher sono indicati.

3. Raccomanda splanchnicotomia con un toracoscopo secondo Kux o Picard per evitare formazione di pietra.

Pitfalls to be Avoided in Thyroidectomy

A Triangle for Localization and Protection of the Recurrent Nerve

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TECHNICAL operative complications still contribute to many thyroid deaths, and too many recurrent nerves are still being injured during thyroidectomy.[1] The reported occurrence of nerve injury from large goiter clinics varies from 0.5 to 8 per cent[2] and is much higher in secondary operations and during the removal of malignant and large nodular goiters. The incidence of nerve injury has now increased since the advent of the antithyroid drugs.[3]

Although many injuries to the recurrent nerve and their sequelae have been reported by various authorities,[4] these probably represent only a small fraction of the total number, for surgeons do not feel disposed to advertise their errors. That the incidence of nerve injuries is higher than the present inadequate statistics would indicate is borne out by the ever-increasing number of operations for the relief of recurrent nerve paralysis which have appeared in recent literature.[5] If the number of patients who have sustained injury to the recurrent nerve during thyroidectomy were known, it probably would be tremendous. And, since no method of treatment for paralysis of the recurrent nerve has yet yielded satisfactory results, prevention is still the only sure remedy.[6]

The recent addition of the thiourea group of drugs to the preoperative preparation of patients with hyperthyroidism would appear to have made the patient entirely safe for operation, but it has made operation less safe for the patient.[7] This group of drugs, while lowering the basal metabolic rate to normal, leaves the thyroid gland in an enlarged and markedly hyperplastic state, so that satisfactory anatomic exposure at the time of operation is more difficult. The gland is reduced in consistency, soft, friable and very hemorrhagic.[8] Although these difficulties are lessened by the omission of propylthiouracil seven to ten days prior to operation and the preoperative administration of iodine, the gland is still left in a state of subinvolution and hyperplasia with its attendant surgical disadvantages and increased tendency to nerve injury.[9] I have therefore employed propylthiouracil in preoperative preparation only when it was felt that lugolization alone was insufficient. For severely ill and toxic patients, however, the advantages of the thiouracils far outweigh their disadvantages. When properly prepared with these drugs, patients do come to operation in good general condition. This permits a careful and precise operative technic with no race against time, which compensates in a large measure for the disadvantages just enumerated.

The most precise dissection of the structures in close proximity to the nerve is mandatory. The importance of localizing the recurrent nerves at the time of operation has been firmly established by many authorities.[10] Lahey and others[11] have written forcefully of the necessity of visualizing the recurrent nerves during thyroidectomy and have proved this a practical and safe procedure in thousands of operations. Although the importance of visualizing the nerve has been sufficiently accepted, localizing and exposing

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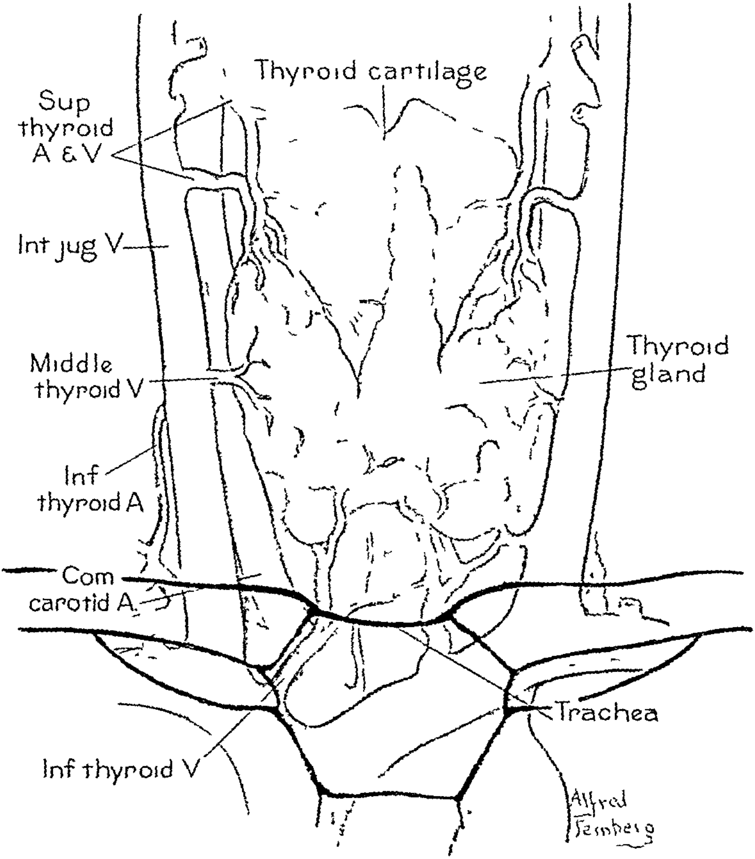

Fig 1—The thyroid gland and its blood supply, showing its relations to the larynx, trachea, sternum and clavicles The blood supply of the thyroid is greater than that of any other structure approached surgically[15] No other organ in the human body has been so well supplied with blood In proportion to its weight, it receives eight times as much blood as the head It has been shown to be five and a half times more vascular than the kidney The blood to the thyroid is supplied by four main trunks All the blood in the body passes through it once an hour Anomalies, when they do occur lead to an even greater circulation Nature has seen to it that nothing should interfere with *the blood supply to this vital structure The importance of this gland is demonstrated in the vegetative* type of existence observed in cretins who are born without the gland, or in myxedema which develops in those who have lost it after birth or through surgical extirpation Palpation for an anomalous ima vessel adds an item of safety here Care should be exercised in the enucleation of substernal goiters to avoid tearing the large veins

the nerve often proves to be a troublesome and time-consuming job in a dangerous area. A surgeon who is not thoroughly familiar with the detailed anatomy here may cause more harm than good by routine attempts to visualize the nerve.

All the anatomic and technical pitfalls are still not fully appreciated. Every goiter operation, no matter how simple, is fraught with great danger, since one small technical error may convert a patient with a mild thyroid disability into one in immediate danger of death or prolonged misery. Injury to one or both nerves occurs not infrequently even in the hands of those skilled in thyroid surgery. Injury to the recurrent nerve, tetany, and persistent and recurring hyperthyroidism still challenge the surgeon.[12] Tetany often goes hand in hand with nerve injury (Fig. 4), and fear of nerve injury is responsible for large remnants and recurring hyperthyroidism (Fig. 4).

Lack of anatomic knowledge and fear of recurrent nerve injury has often "stampeded" the surgeon to limiting himself to a fractional resection of the gland. The part of the gland frequently left behind is as much diseased as the part removed. Preservation of function is often given as the reason for leaving these large remnants, but fear of injury to the recurrent nerve is often greater than fear of producing myxedema. That state of mind often results in inadequate removal of tissue, for the surgeon becomes conservative as the feared structures are approached. Though every thyroid surgeon knows the general position of the recurrent nerves, the greatest tragedies that follow thyroid operations follow their injury. Studies of large series of cases have confirmed the fact that damage to the nerve is frequently the result of operative trauma, i.e., accidental division, crushing, or inclusion in a suture during thyroidectomy.[13]

These injuries usually result in permanent paralysis of the recurrent nerve. Injury to even one nerve may cause postoperative symptoms severe enough to require tracheotomy, and bilateral injury is a major catastrophe. Indeed, the prevention of death demands complete protection of the recurrent nerves during operation, since the control of the laryngeal musculature is transmitted entirely from the central nervous system through these nerves. The inferior or recurrent laryngeal nerve is practically the only motor nerve of the larynx.[14] The superior laryngeal nerve is the sensory nerve of the larynx, supplying only a single small motor branch (the external) to the cricothyroid muscle. Practically all movements of the intrinsic muscles of the larynx, therefore, are controlled by impulses transmitted through the inferior or recurrent nerves.

The recurrent nerve is peculiar not only anatomically but physiologically.[15] It performs the function of double impulse nerve conduction in a single trunk. That is, it carries two sets of fibers to opposing muscles, the abductor and the adductor. These muscles open and close the glottis. Although the chief function of the larynx in man and animal is to prevent the entrance of anything but air into the lungs, this organ is now known to have ten well established functions: (1) phonatory; (2) respiratory; (3) protective; (4) deglutitory; (5) tussive; (6) circulatory; (7) fixative; (8) expectorative; (9) emotional; and in grazing animals the larynx participates in a tenth function, olfaction. This gives the animal the full power of smell even though the mouth is open, thus helping in the detection of undesirable food. It is not the scope of this paper to enter into a detailed discussion of the physiology of the larynx and vocal cords, but it is important that their numerous vital functions be understood, since both the vocal cords and the larynx are controlled by the recurrent nerves. It is thus apparent that any injury to the recurrent nerves impairs all the functions aforementioned and that bilateral recurrent nerve paralysis is a major calamity. Immediate or delayed operations for the repair or reconstruction of the cut or otherwise

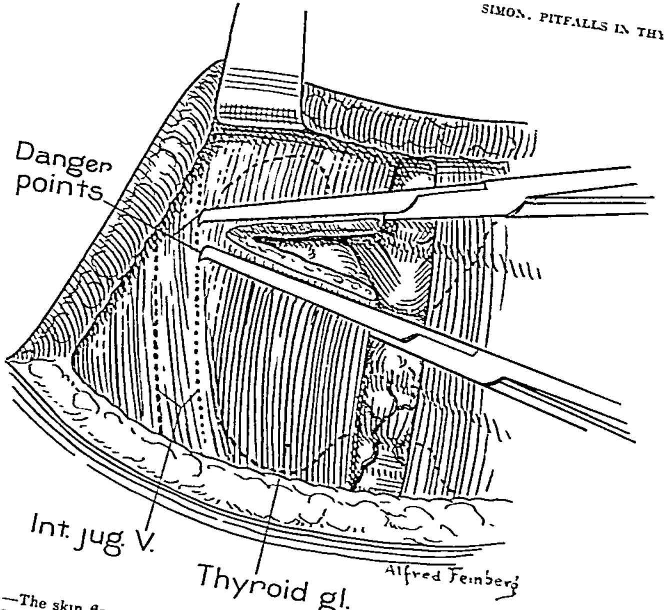

Fig 2—The skin flap is elevated above the level of the notch in the thyroid cartilage. This permits adequate exposure of the superior pole. The clamps are applied across the prethyroid muscles at a high level, in order not to disturb their innervation. The clamps should be applied under direct vision in order to safeguard the internal jugular vein.

mutilated recurrent nerves are not only extremely difficult, but to date no one has reported a proved return of functions even after immediate direct anastomosis.[16] It is doubtful that restoration of function will ever be accomplished by this method, because of the double impulse nerve conduction in the single trunk of the nerve as has been described.

Hence, the success of the operation hinges on the recurrent nerve. The recurrent nerve still dignifies the thyroid operation, because any operation upon the thyroid gland, no matter how trivial, endangers the nerve, and without functionng recurrent nerves life is short and niserable. Therefore, any method which helps reduce the incidence of nerve complication deserves serious consideration.

In 1943 I described an anatomic triangle based on fixed boundaries which makes localization of the nerve simple, speedy and safe.[17] The triangle is easily identified and remembered and emphasizes a vital triangular area in thyroid surgery, just as Calot's triangle brings to mind and emphasizes a vital triangular area in biliary surgery. Knowledge of the boundaries of the triangle makes localization and identification of the recurrent nerve a simple and rapid maneuver. This anatomic triangle is bounded laterally by the common carotid artery, above by the inferior thyroid artery, [illegible] ially by the recurrent nerve. To avoid injury of the nerve, familiarity with this area is best obtained by cadaver dissection. The anatomy of this region, when well learned on the cadaver, fortifies the operator's confidence in operating on the thyroid.

My method of exposing the triangle during thyroidectomy is essentially the same as that reported in 1943.[17] What I have observed and heard since encourages me to review some things which were presented in detail at that time, and to add some suggestions which were omitted in the previous paper.

Rough handling or premature attempts to elevate the gland will not only tear large veins but can cause serious hemorrhage, serious only because it obscures all the landmarks and vital structures. Hence, a painstaking ligation and division of the lateral or middle thyroid vein binding the lobe to the internal jugular is important. One must adopt a fundamental anatomic approach and anticipate any

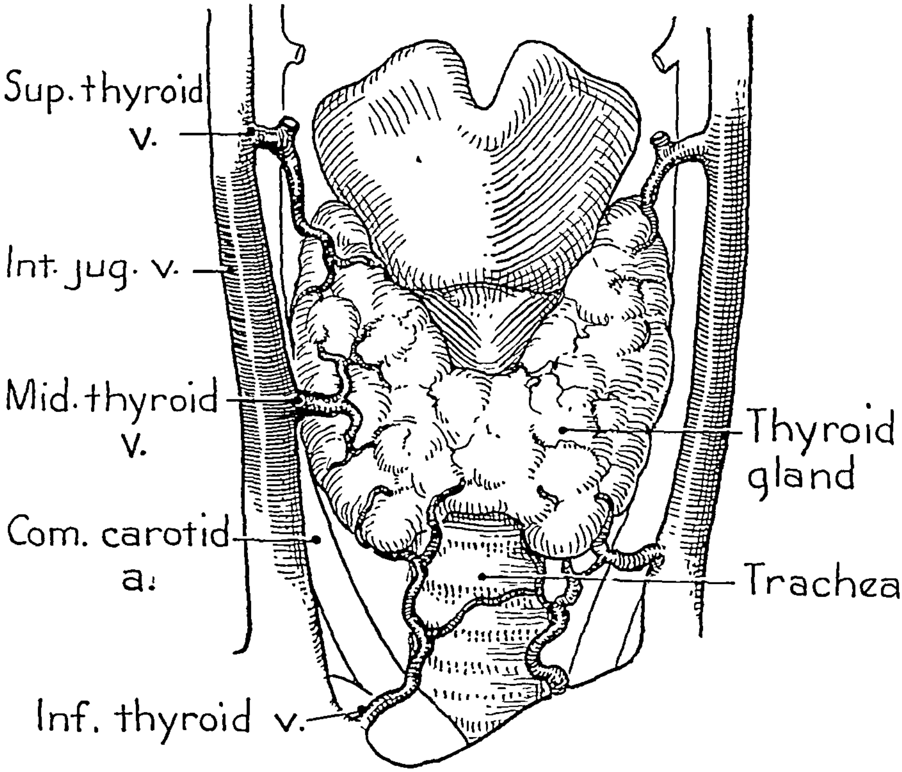

Fig. 3.—The middle thyroid vein arises from the lateral aspect of the lobe of the gland and passes laterally and empties into the internal jugular vein. There may be more than one. These veins vary both in length and in diameter.[14a] The middle thyroid vein may be very thin, short, distended and easily torn when enucleation of the lobe is attempted. It is a common source of troublesome hemorrhage. When the gland is exposed and partially mobilized, the middle thyroid vein comes into view and careful dissection at this point is very important. The middle or lateral thyroid vein is not always prominently distended. Elevation and traction of the lobe empty it. It is thin-walled; it tears easily and, if not controlled promptly from the beginning, stains the area with blood and makes the subsequent dissection difficult. A short middle thyroid vein as shown above draws the internal jugular medially, where it may be injured if the Kocher clamps are applied blindly during division of the strap muscles (Fig. 2). Note that the superior and inferior thyroid veins are often long and tortuous, permitting elevation of the lobe after the middle thyroid vein has been divided.

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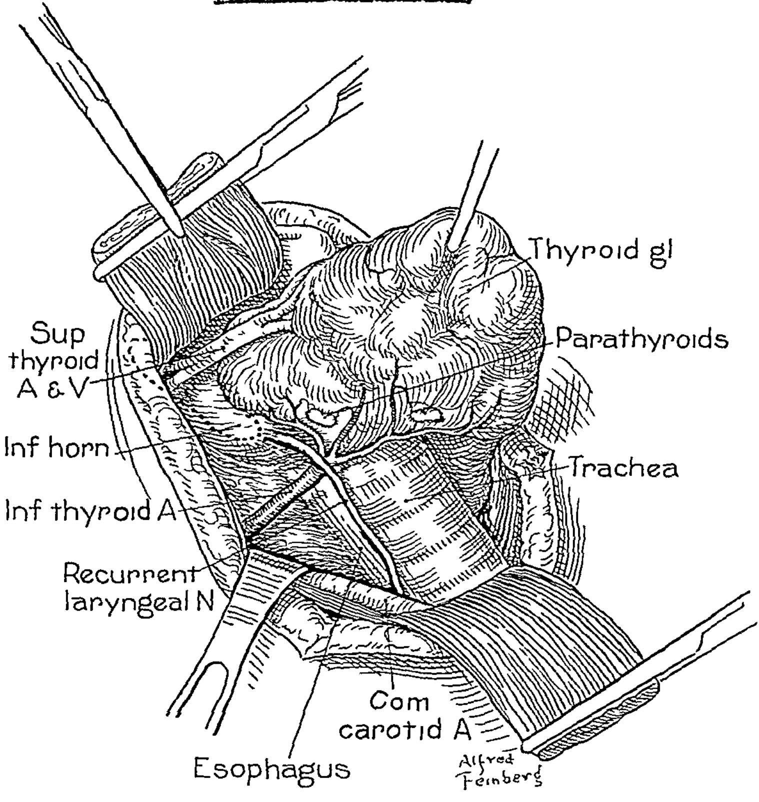

Fig 4—Drawing of author's dissection, showing the elevated lobe The lobe should be elevated and delivered carefully to prevent tearing of sclerotic vessels Note that the triangle is exposed without severing the superior pole or the inferior thyroid artery These vessels are usually tortuous, with sufficient slack to permit elevation of the lobe The nerve is now visualized, and extracapsular ligation of the vessels can be done Note that the nerve here is anterior to the artery A consideration of the anatomy of the parathyroids discloses that the same precaution used against recurrent nerve injury serves to protect the parathyroids

variation, since any possibility can become an actuality The accompanying drawings, with their legends, clearly illustrate the method of exposing the triangle In many instances only the middle or lateral thyroid vein requires detachment Division of this vein usually permits elevation of the lobe and exposure of the triangle Occasionally the superior pole and the inferior thyroid veins require detachment for more satisfactory elevation of the lobe of the gland Complete detach-

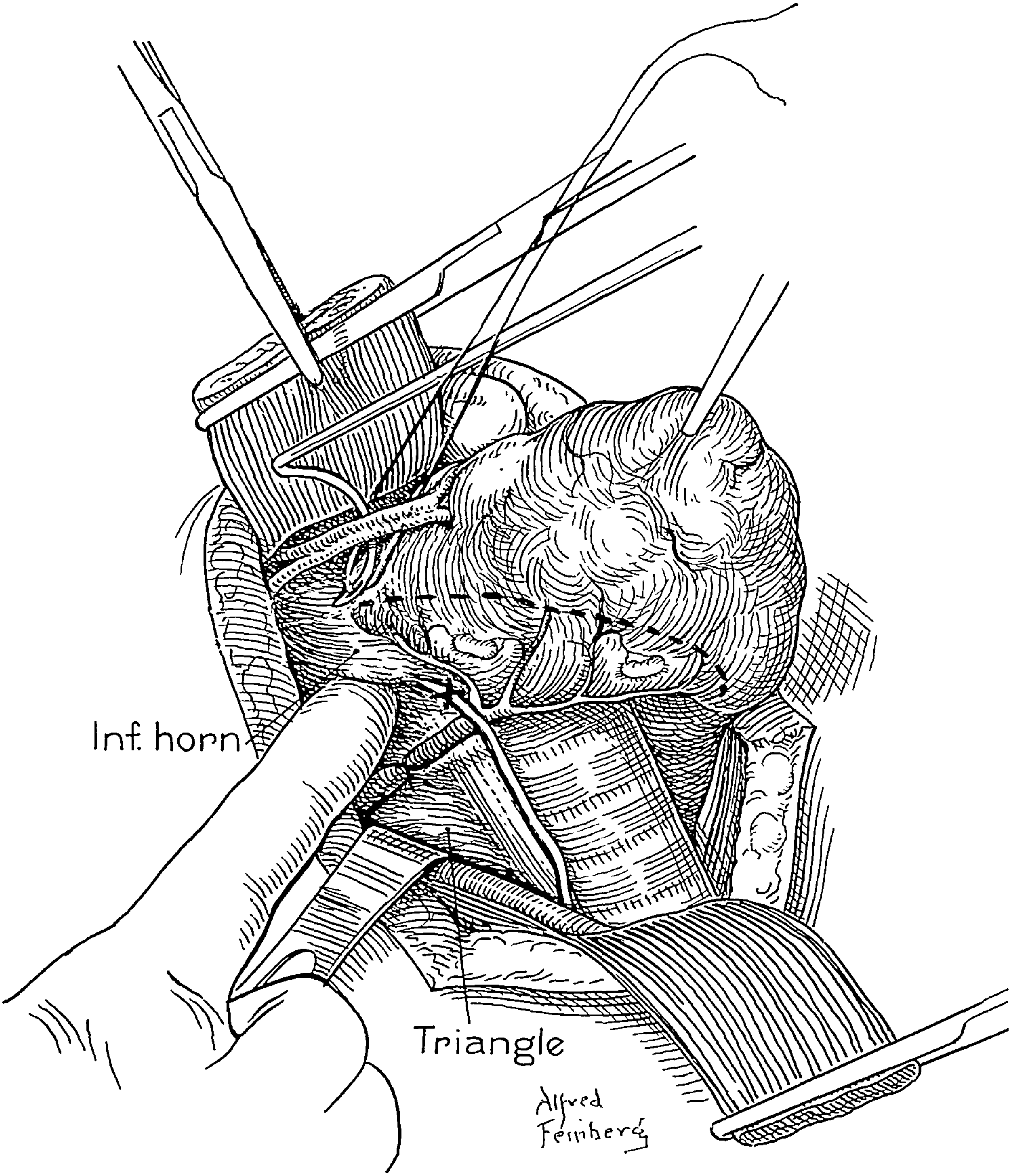

Fig. 5.—The inferior thyroid artery is uniformly at least one-third larger than the superior thyroid and is anatomically less variable.[2] Note that the superior thyroid vessels are secured from within outward, with the surgeon's left index finger palpating the inferior horn of the thyroid cartilage. This avoids the terminal branch of the recurrent nerve just as it dips under the inferior horn. X indicates the common site of nerve injury, i.e., where the upper branch of the inferior thyroid runs parallel to the nerve. Although the recurrent nerve may be traumatized at any point in its course through the operative field, it is more exposed to injury at the point marked X, because the nerve is hidden here by the lower fibers of the inferior constrictor muscle and obscured by bleeding from the upper branch of the inferior thyroid. Clamping or suturing a bleeding point in this area or anywhere in the neighborhood of the inferior horn of the thyroid cartilage (which is easily palpable) is fraught with great danger to the nerve. Bleeding in this area is controlled when the trunk of the inferior thyroid artery is ligated as it comes up from behind the carotid. This method of dealing with the inferior thyroid artery has alone reduced the incidence of recurrent nerve injuries to zero in a series of 230 cases, with no parathyroid tetanies or other complications.[1c]

ment of the lobe of the thyroid from the internal jugular vein, however, is seldom required for satisfactory visualization of the triangle The superior pole is, therefore, usually not divided until the triangle is exposed (Figs 4, 5 and 6)

Any attempt to save the few minutes required for localization of the triangle and extracapsular ligation of the vessels may be dearly bought Once the triangle is properly exposed, the surgeon never need fear bleeding or the slipping of a ligature, for the arterial supply to the lobe is in view and under the finger, hence bleeding is easily controlled under direct vision

With the better preparation of the patient for surgical treatment of the thyroid today, speed has become less important than a careful anatomic technic, besides, a more precise technic does not always prolong the operation Roughness and haste can prove disastrous Rupturing a vessel while dislocating the lobe is not uncommon Tearing the gland by excessive traction can produce severe hemorrhage The thyroid arteries must be handled gently, because they are apt to be brittle and may easily be torn or cut through by a ligature that is tied too tightly Rough elevation of the lobe is especially hazardous in old goiters which have undergone degenerative change because the thyroid vessels may be sclerotic and calcified In patients with sclerotic vessels or chronic thyroiditis, therefore, it is important to have adequate exposure and to proceed carefully

Overconfidence is a danger in surgery as in any other undertaking Even when a procedure seems safe, it is still wise for the surgeon to pause and consider ways of making it safer One can never afford to be overconfident, especially in operations for goiter, whatever his experience may have been

Since the major causes of injury to the recurrent nerve are poor exposure and hemorrhage, the surest way to avoid these dangers is to obtain good exposure and adequate control of the blood supply early [18] This is accomplished when the thyroid triangle is exposed With extracapsular ligation of the inferior thyroid artery, there is less bleeding Although the blood supply of the thyroid is greater than that of any other structure approached surgically and the control of bleeding is important, the real danger is seldom from loss of blood Unexpected hemorrhage from a torn or cut branch of the inferior thyroid artery is frequently the beginning of a vicious circle The inexperienced surgeon fails to realize that compression or extracapsular ligation of the trunk of the inferior thyroid artery stops the bleeding Instead of this, wild clamping or suturing is often resorted to, with injury to the recurrent nerve Blind attempts to control bleeding in this area from branches of the inferior thyroid artery can produce injury not only to the nerve but the trachea, the parathyroids and even the esophagus [19]

Experience has shown that it is much easier routinely to ligate in continuity one single trunk (the inferior thyroid artery) a safe distance away from the nerve than to attempt to secure its branches and ramifications, which are in intimate relation to the recurrent nerve and the parathyroids [9] Trouble is avoided if the inferior thyroid artery is secured at an early stage of the operation De Quervain insisted upon the advantage of securing the arteries before approaching the veins [10b] In fact, he made it a rule to secure the inferior thyroid artery first Since extracapsular ligation of the inferior thyroid artery is hazardous unless the recurrent nerve is first visualized, it is safer to identify the nerve before ligation of the vessel This is achieved when the triangle is exposed as described (Figs 4, 5, 6*A* to 6*H*, and 7)

After the lobe of the gland is delivered and the triangle visualized, the whole lobe is felt and seen before any operation is performed upon it (Figs 4 and 5) Many mistakes have been made from lack of this precaution It is difficult to tell how much of the lobe is being removed if the entire lobe is not visualized If the gland is not rotated from its bed,

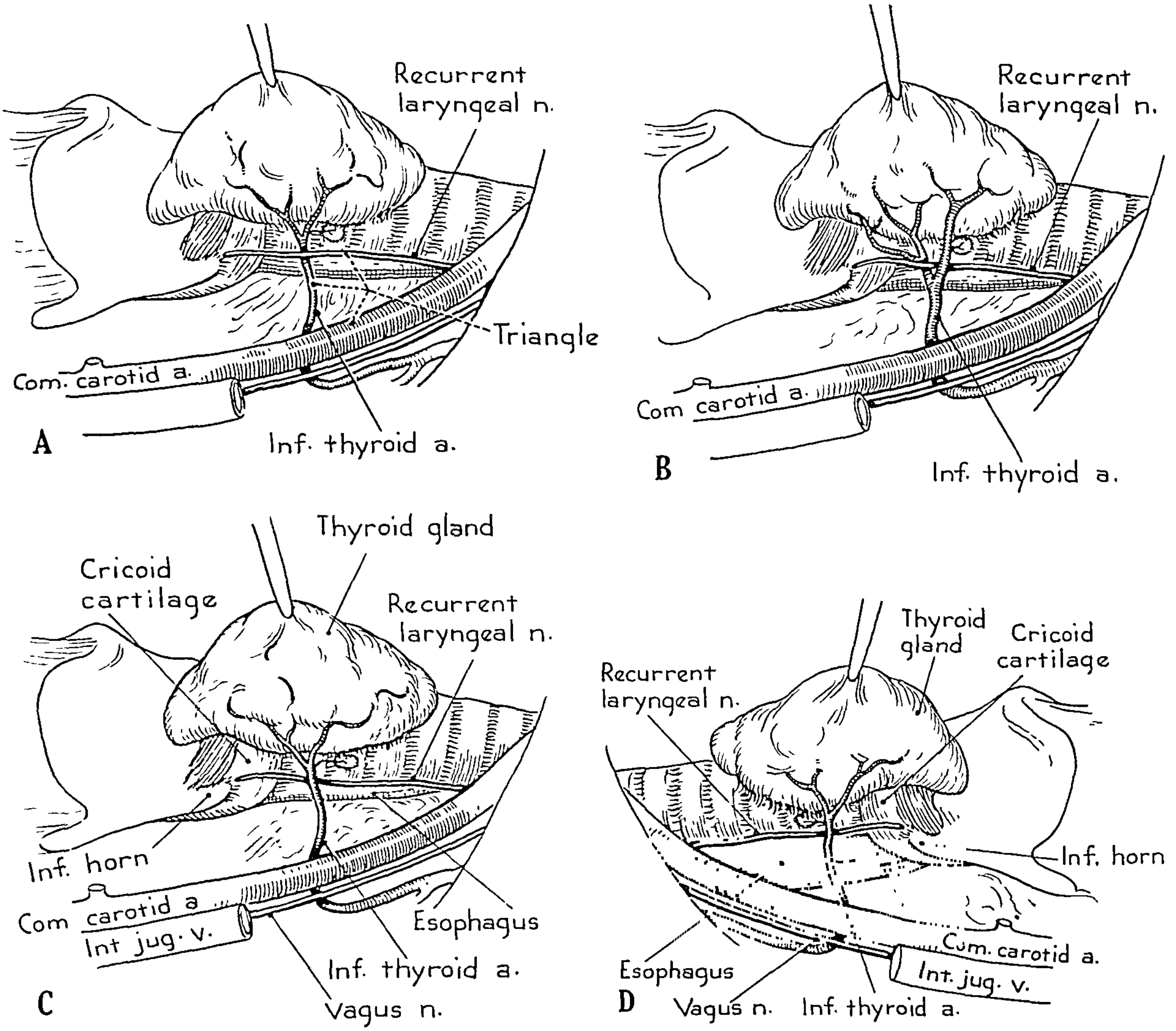

Fig. 6.—Variations of the inferior thyroid artery in its relation to the recurrent nerve in the dissected triangles. When the nerve is anterior or between the branches of the inferior thyroid artery as shown in Figures 4, 5, 6*A*, 6*E*, and 6*F*, it is especially liable to injury unless the boundaries of the triangle are identified. Following the inferior thyroid artery to the lobe leads to the nerve when it is anterior. Variations in the recurrent nerve are uncommon.[23] Variations in the inferior thyroid artery are the more frequent cause of accidental injury to the recurrent nerve.[23b] *A*, drawing of the author's dissection, showing the triangle on the right side with its three boundaries. The recurrent *nerve here is anterior to the inferior thyroid artery. This is an occasional relationship and occurred* 7 times in 86 triangles dissected by the author in 43 cadavers. *B*, drawing of the author's dissection, showing a triangle on the right side with the recurrent nerve passing between the branches of the *inferior thyroid artery. This is an uncommon relationship and occurred 4 times in the 86 triangles.* Note the intimate relationship of the upper branch of the inferior thyroid artery to the recurrent nerve. *C*, drawing of the author's dissection, showing a triangle on the right side with the recurrent *nerve posterior to the inferior thyroid artery. This is the usual relationship and occurred 32 times* in the 86 triangles. Note that the floor of the triangle is formed almost entirely by loose areolar connective tissue. *D*, drawing of the author's dissection, showing a triangle on the left side. The recur*rent nerve here is posterior to the inferior thyroid artery. This is the usual relationship and occurred* 33 times in the 86 triangles dissected. Note that the esophagus is more prominent on the left side and partially forms the floor of the triangle.

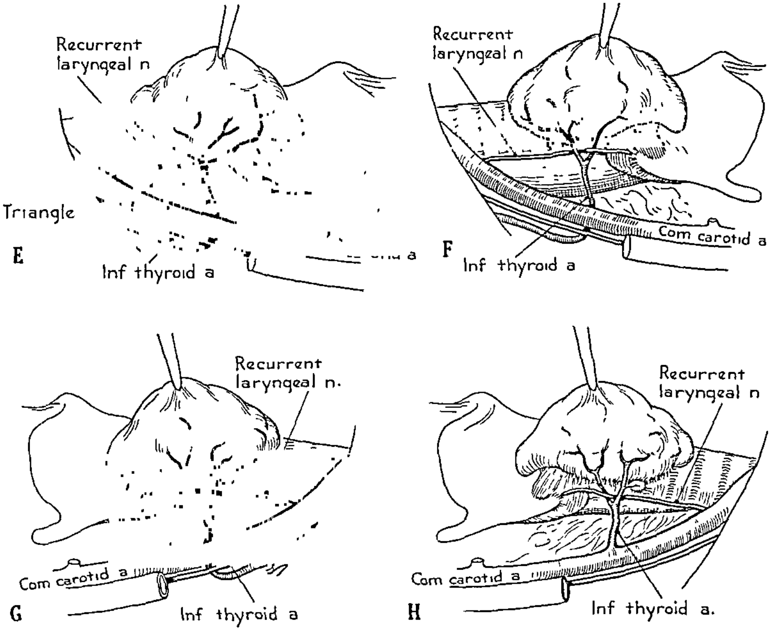

Fig. 6 (*continued*).—*E*, drawing of the author's dissection, showing a triangle on the left side with the recurrent nerve anterior to the inferior thyroid artery. This is an occasional relationship and occurred 8 times in the 86 triangles. Note the intimate relationship of the upper branch of the inferior thyroid artery to the recurrent laryngeal nerve. *F*, drawing of the author's dissection, showing another triangle on the left side, with the recurrent nerve running between the branches of the inferior thyroid artery. This is a rare relationship and occurred twice in the 86 triangles. *G*, drawing of the author's dissection, showing a bifurcation of the inferior thyroid artery just under the carotid, giving the impression of a double inferior thyroid artery. This was encountered once in 86 triangles. The lateral gutter must be searched carefully for this anatomic variation. The division occurs behind the carotid sheath, and the overlooked trunk may be the source of free bleeding when the gland is resected. *H*, an inferior thyroid artery coming directly off the common carotid. This anomaly was encountered once in the 86 triangles dissected.

it is impossible to estimate the exact amount of thyroid tissue left. Moreover, parathyroids occasionally are visualized and spared. A more complete removal of the lobe is thus possible and insures that no large remnants are left behind. The consensus is that it is far better to err on the side of complete removal, since postoperative hypothyroidism is greatly preferable to persistent toxicity. Besides, in certain thyrocardiac patients myxedema is even desirable.

There is occasionally s vid ria- tion in the gross pathol f the gland that one cannot standardize the operation to too high a degree. The technic must fit the observations. Localization of the triangle is recommended, but with the reservation that in a certain number of cases this procedure may be difficult or even undesirable. If anomalies make it difficult to locate the inferior thyroid artery, or anomalous ramifications of the lateral thyroid veins obscure the posterior aspect of the gland and its adjacent structures, or if the gland is friable, adherent, or difficult to mobilize, or any difficulty is encountered to complete lateral exposure of the lobe, one has no choice but to omit extracapsular ligation of the inferior thyroid artery. When the triangle cannot be visualized and extracapsular ligation of the inferior thyroid artery cannot be accomplished, the incidence of recurrent nerve injury has been shown to be greater.[21] It is an axiom of surgery that anything which cannot be seen, especially if it is in the operative field, is in danger of injury. There certainly can be no argument about the necessity for localization of the nerve in complete thyroidectomy; or enlarged bilateral adenomatous lobes without normal thyroid tissues; or diffuse toxic goiters in which cardiac damage or carcinoma of the thyroid is present.

The triangle, when exposed, visualizes the common carotid and inferior thyroid arteries and the recurrent nerve in the order mentioned, and occasionally a parathyroid body at the intersection of the inferior thyroid artery with the recurrent nerve (Figs. 4 and 5).

This insures adequate and safe removal of the involved gland.

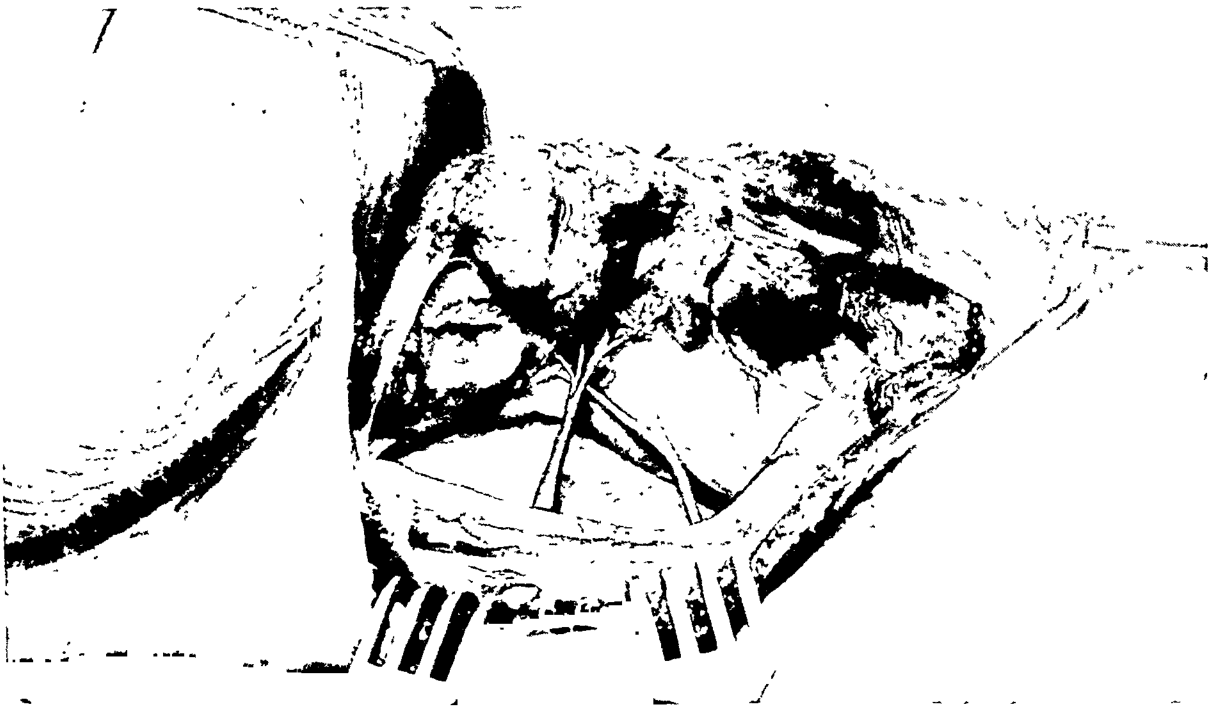

Fig. 7.—Photograph of the author's dissection of a triangle on the right side. The inferior horn of the thyroid cartilage has been bared in order to show the recurrent nerve terminating under the horn. The superior pole vessels have not been severed in order to indicate the preferred site of ligation; i.e., above the level of the inferior horn of the thyroid cartilage (see Figure 5). Note the parathyroid body just outside the triangle. Note the branching of the recurrent nerve. The nerve occasionally divides into two branches, one of which supplies the adductors and the other the abductors and constrictors of the larynx. It is, therefore, possible to produce either abductor or adductor paralysis by injury to the respective branches and to produce intermediate or cadaveric paralysis by injury of the trunk of the nerve (King [see references 1^{l} and 2^{c}]).

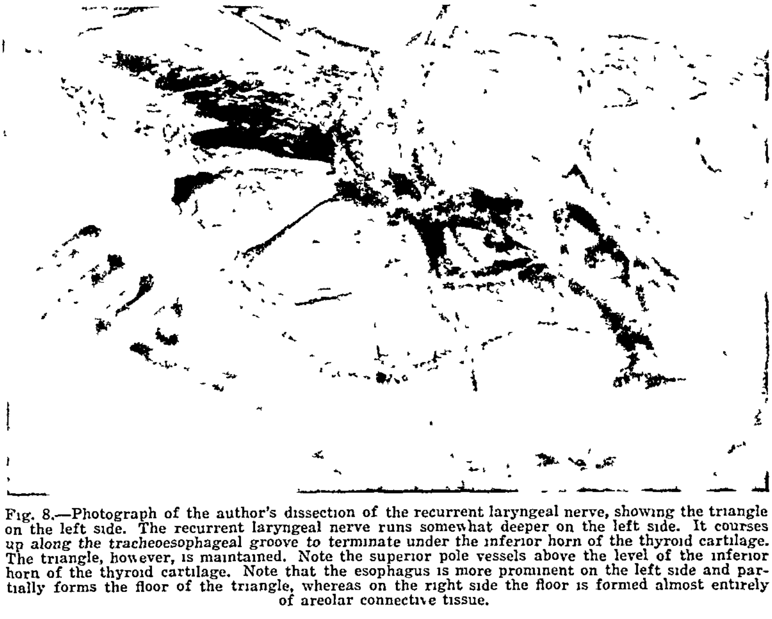

Fig. 8.—Photograph of the author's dissection of the recurrent laryngeal nerve, showing the triangle on the left side. The recurrent laryngeal nerve runs somewhat deeper on the left side. It courses up along the *tracheoesophageal groove to* terminate under the inferior horn of the thyroid cartilage. The triangle, however, is maintained. Note the superior pole vessels above the level of the inferior horn of the thyroid cartilage. Note that the esophagus is more prominent on the left side and partially forms the floor of the triangle, whereas on the right side the floor is formed almost entirely of areolar connective tissue.

SUMMARY

The author describes a relationship of the recurrent laryngeal nerve, the inferior thyroid artery and the common carotid artery. These structures consistently form a triangle. The nerve forms the inverted base of the triangle, while the two arteries form the other two boundaries. The nerve crosses usually behind, sometimes in front of the inferior thyroid artery, and occasionally between its branches. The common carotid artery is easily identified by its size, its location in the carotid sheath, and its pulsation. The inferior thyroid artery, a branch of the thyrocervical trunk, approaches the posterolateral surface of the thyroid lobe, coming from behind the carotid sheath and entering the gland at the level of the cricoid cartilage and carotid tubercle of the cervical portion of the spine. These three structures thus produce the aforementioned triangle. Most injuries to the nerve occur in the vicinity of branches of the inferior thyroid artery. The method of exposing the triangle is described, and the pitfalls to be avoided in thyroidectomy are discussed.

RESUME

L'auteur décrit ici les rapports du nerf récurrent (laryngé), de l'artère thyroidienne inférieure et de la carotide. Ces éléments forment toujours un triangle. Le nerf se trouve à la base inversée du triangle, tandis que les deux artères, les deux côtes. Le nerf traverse habituellement en arrière de la thyroide, [illegible] fois en avant et quelquefois [illegible] les

La carotide est facile à identifier par son diamètre, sa localisation et sa pulsation. L'artère thyroide inférieure, une branche du tronc thyro-cervical suit la face postéro-latérale de la thyroide en venant de la carotide, pénètre das la glande au niveau du cartilage cricoide et du tubercule carotidien de l'épine dorsale cervicale. Ces 3 éléments forment donc ainsi le triangle plus haut décrit. La plupart des accidents qui surviennent au nerf, se font au voisinage des branches de l'artère thyrodienne inférieure. L'auteur décrit ici une méthode pour localiser le triangle et ainsi éviter les achoppements qui surviennent durant une thyroidectomie.

RESUMEN

Se describe una relación del nervio recurrente laríngeo, la arteria tiroidea inferior y la arteria carótida primitiva. Estas estructuras forman consistentemente un triángulo, cuya base invertida está formada por el nervio y los otros dos lados por las dos arterias. El nervio pasa ordinariamente detrás, a veces por delante de la arteria tiroidea inferior y ocasionalmente entre sus ramas. La arteria carótida primitiva es fácil de identificar por su tamaño, localización en la vaina carotídea y su pulsación. La arteria tiroidea inferior, rama del tronco tirocervical, llega a la superficie posterolateral del lóbulo tiroideo de la parte posterior de la vaina carotídea, entrando a la glándula a nivel del cartílago cricoide y el tubéerculo carotídeo de la columna cervical. Estas tres estructuras forman entonces el mencionado triángulo. Muchas de las lesiones del nervio ocurren en la vecindad de las ramas de la arterio tiroidea inferior. Se describe el método para exponer el triángulo y se discuten las dificultades que deben evitarse en la tiroidectomía.

ZUSAMMENFASSUNG

Der Verfasser beschreibt die Beziehung zwischen dem Nervus recurrens, der unteren Schilddruesenarterie und der Arteria carotis communis. Diese Gebilde formen stets ein Dreieck. Der Nerv stellt die Basis des auf dem Kopfe stehenden Dreiecks dar, waehrend die beiden Arterien die anderen beiden Seiten bilden. Der Nerv ziecht gewoehnlich hinter und manchmal vor der unteren Schilddruesenschlagader entlang; gelegentlich verlaeuft er zwischen ihren Aesten. Die Carotis communis ist an ihrem Umfang, ihrer Lage in der Karotisscheide und ihrer Pulsation leicht zu erkennen. Die ùntere Schilddruesenschlagader, ein Ast des Truncus thyreocervicalis, tritt an die hintere laterale Flaeche des Schilddruesenlappens heran. Sie kommt von der Hinterflaeche der Carotisscheide und betritt die Schilddruese in der Hoehe des Cricoidknorpels und des Tuberculum caroticum des sechsten Halswirbels. Diese drei Strukturen bilden so das oben erwaehnte Dreieck. Die meisten Verletzungen des Nerven erfolgen in der Umgebung der Aeste der unteren Schilddruesenarterie. Eine Methode, das Dreieck frei zu legen, wird beschrieben, und die bei der Schilddruesenresektion zu vermeidenden Gefahren werden eroertert.

RIASSUNTO

L'A. ha descritto un parentado del nervo laringeo ricorrente, l'arteria tiroidea inferiore, e l'arteria comune carotidea. Queste strutture formano conseguentemente un triangolo. Il nervo forma la base inverso del triangolo, mentre le due arterie formano gli'altri termini. Il nervo attraversa indietro ordinariamente, qualche volte davanti l'arteria tiroidea inferiore, ed occasionalmente fra i suoi rami. L'arteria tiroidea comune e' identificata facilmente dal calibro, dalla locazione nel fodero carotidea, e dalla pulsazione. L'arteria tiroidea inferiore, un ramo del tronco tireocervicale, avvicina la superficie postero-laterale del lobo tiroideo arrivando d'indietro il fodero carotideo ed entrando la ghiandola a livello della cartilagine cricoideo e tubercolo carotideo della spina cervicale. Queste tre strutture di questo modo producono il suddetto triangolo. I piu frequenti traumi al nervo si presentano nella vicinanza dei rami dell

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'arteria tiroidea inferiore Il metodo di esporre il triangolo e' descritto e le trappole di essere evitare nella tiroidectomia sono discusse

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Echoes of the Past

VIII. A Medical Legend of 1874

Dusting the cobwebs from ancient volumes and periodicals, one finds an occasional curious item in the archives, apparently recorded in all seriousness. The following Civil War story appeared in the *American Medical Weekly* of November 7, 1874; contributed by a Dr. L. G. Capers of Vicksburg:

A certain widow had two daughters, one aged fifteen and the other seventeen. These ladies were patriotically moved to care for the wounded. Their home was opened to the casualties of war. On May 12, 1863, their residence was in the line of fire between a portion of Grant's army and a group of Confederate soldiers. During the battle a gallant and noble friend of the narrator was wounded. He staggered and fell to the ground. Almost simultaneously a piercing cry was heard in the house of the widow with two daughters. Examination of the wounded soldier showed that a bullet had passed through the scrotum and carried away the left testicle. The same bullet had apparently penetrated the left side of the abdomen of the seventeen-year-old girl, midway between the umbilicus and the anterior superior spinous process of the ilium, and had become lost in the abdomen. The girl suffered an attack of peritonitis, but recovered in two months under the treatment administered.

Just two hundred and seventy-eight days after the impact of the minie ball she was delivered of a boy weighing eight pounds.

The hymen was intact, and the young mother strenuously insisted upon her virginity and innocence.

About three weeks after this remarkable birth Dr. Capers was called to see the infant, and the grandmother insisted that there was something wrong with the child's genitals. Examination showed a rough, swollen and sensitive scrotum, containing some hard substance. He operated, and extracted a smashed and battered minie ball. His conclusion was that this was the same ball that had carried away the testicle of his young friend, that it had penetrated the ovary and uterus of the young lady, and that some spermatozoa upon it had impregnated her. With this conviction he approached the young man and told him the circumstances. The soldier appeared skeptical at first, but consented to visit the young mother. A friendship ensued, which soon ripened into a happy marriage. The pair had three subsequent children.

This story does not have any semblance of possibility. It is, however, an example of the heights of imagination to which a medical mind may rise.

—*Bernard J. Ficarra, M.D., F.I.C.S.*

Tumors of the Jaws

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TUMORS of the jaws are of clinical importance to the dentist and several medical specialists The general practitioner himself should be sufficiently familiar with these tumors to recognize them early, that proper reference of the patient may be made quickly for adequate treatment and rehabilitation In the past, therapy of tumors of the jaws has been too conservative, largely because of poor functional and cosmetic results Advances in plastic and reconstructive surgery and the increasing use of prosthetic appliances have removed the bugaboos of disfigurement, poor phonation, and difficulty in masticating and swallowing We have 2 patients, young women, who had the jaws resected for benign tumor which could have become malignant later, in 1 the resected portion of the mandible was regenerated from the remaining periosteum, and the patient wears a splendid prosthesis The second patient required bone grafting Both young women have married, and one is now a mother Two other examples of good rehabilitation may be cited A minister lost his jaw and considerable soft tissue because of cancer of the gingiva, he is now preaching twice on Sunday (in German and English) with the aid of a public address system The other patient is a woman of middle age who lost her jaw and adjacent soft tissue from cancer of the tongue and floor of the mouth She now sings in a choir

Because the jaws arise as maxillary and mandibular processes of the first branchial arches and are covered with epithelium, and because jaws also contain teeth, the variety of tumors that may occur in the jaws is almost legion Fortunately, however, tumors of the jaws are not common, especially the more serious types The jaws are bones covered with epithelium In this paper the discussion will be limited entirely to tumors primary in the jaws, that is, those arising from the epithelium of tooth germ elements, connective tissue, bone, and blood vessel tumors Since this paper is largely clinical, a prolonged embryologic discussion will not be given The results of a study of 534 cases of tumors of the jaws are presented in Table 1 *

CLASSIFICATION

The number and diversity of types of tumors of the jaws often complicate classification, confusing the student who is not familiar with jaw tumors and the clinician who sees them but rarely Table 2 gives a classification which we hold to be simple and readily understood There are two main types of primary tumors in the jaws, (*1*) those arising from ectoderm and (*2*) those arising from mesoderm A third and less common type is the mixed tumor having both ectodermal and mesodermal elements A fourth type requires mention, although fortunately it is not common, the occasional metastatic tumor associated with carcinoma or sarcoma elsewhere in the body In this group may

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*Three hundred and thirty eight of these cases were reported by Geschickter in 1935 Our study of 196 cases began with those patients who entered the Johns Hopkins Hospital after that date

TABLE 1.—*534 Primary Tumors of the Jaws (Johns Hopkins Hospital)*

Epithelial and benign osseous tumors			467
Radicular cysts		66	
Follicular and dentigenous cysts		33	
Central epithelial cysts		1	
Adamantinomas		109	
Odontomas		5	
Giant cell epulis		112	
Central giant cell tumors		27	
Osteomas and ossifying fibromas		114	
Malignant osseous tumors			48
Osteogenic			
Sclerosing	17		
Chondral	11		
Ewing's sarcoma		19	
Nerve tissue tumor		1	
Primary epithelial tumors			19
Epidermoid cancer exclusive of antral tumors		10	
Adenocystic basal cell epitheliomas		8	
Aberrant salivary tissue tumors		1	

also be included benign or malignant tumors which invade the jaws from adjacent soft tissue or from the antrum.

ROENTGEN CHARACTERISTICS

Careful roentgenologic study of tumors of the jaws over a period of years, in which diagnosis has been checked by histologic examination, has led us to the following conclusions, which are helpful, but not absolute, in making a provisional diagnosis prior to biopsy or operation.

Benign Tumor.—It is not always possible to differentiate between simple or multilocular cysts and some benign nonosseus tumors. As a rule, both produce a radiolucent area or areas with a more or less regular outline and with a small, dense white line at the edge. They may be single, multiple, or multilocular.

Benign nonosseus tumors, when of sufficient size, expand the jaws and thin the cortex or destroy it by pressure, but they do not invade the cortex, and they do not initiate a periosteal reaction. They are usually oval or circular.

On the other hand, osteofibroma may not have a definite border, and may expand and thin the cortex without periosteal reaction.

There is no definite soft tissue change surrounding the benign tumor in the jaws. Benign giant cell tumors are apt to have trabeculations, but these are not always present, particularly if the shadow is singular. Trabeculations may be present also in ameloblastoma, fibrocystic disease and myxoma. In the last-mentioned condition the trabeculations are apt to be in the form of lines through the tumor instead of round compartments (Thoma).

Position of the Teeth: Benign cysts and tumors may appear at the apex or side of the teeth. By definition a dentigerous cyst contains the crown of a tooth, although fibro-osteomas and adamantinomas occasionally enclose the crown of a tooth in a radiolucent area. The areas may be more opaque when they contain bone spicules. The teeth are often displaced by pressure of a benign cyst or tumor, the direction of displacement depending upon the relation of the pathologic process to the crown, root or neck of the tooth. The root of a tooth may be destroyed by pressure of a benign tumor. It is interesting that the root of a tooth is rarely destroyed by a malignant process; rather, it is common for the root literally to hang in the bone cavity resulting from malignant destruction. Such malignant destruction may be caused by central malignant neoplasm, primary or metastatic; or by invading neoplasm from adjacent tissue.

Malignant Tumor.—Invasion of the jaw by a malignant tumor usually gives an irregular, moth-eaten appearance. "Bones react to the growth of tumors in very much the same way whether the tumors are benign or malignant, primary or secondary. This reaction is also independent of whether a skeletal tumor is soft or is bone-producing. With rare exceptions . . . the reaction of tumors of bones can be regarded as a combination of two principal changes. The first is characterized by the resorption of bone tissue, caused by growth of the tumor; the second is characterized by the production of new bone, compensating for the loss of bone in developing mainly under functional stimuli" (Weinmann and Sicher, 1947).

Since malignant tumors cause rapid resorption of bone, permitting little time for new bone formation, irregular areas of bone loss appear as radiolucent spaces of varying size and shape. The bone cavities may show some bone opacity caused by the presence of tumor tissue itself. Occasionally *there may be new bone spicules* laid down, or new bone may develop beneath the periosteum at the edge of the tumor (Codman).

Ameloblastomas represent a more or less intermediate stage between malignancy and benignity. Since *ameloblastoma* tends to hollow out small, more or less rounded areas in the bone, a honeycomb or soap-bubble appearance may result. In 2 of our cases of adenocystic basal cell epithelioma the mandible appeared to have been shot through with buckshot; each little hole representing true bone destruction by a nest of malignant cells.

In the presence of malignancy the bone destruction may be central, alveolar or peripheral. Central destruction occurs if the malignant growth is primary in the central portion of the mandible or metastatic from neoplasm elsewhere. Alveolar *destruction is usually due to invasion from* the adjacent mucous membrane, and peripheral destruction occurs as direct extension takes place from an attached neoplasm along the lateral, the lower or the

TABLE 2.—*Ectodermal Tumors (Primary in Jaw)*

Congenital	*Dental Epithelium*	*Oral Epithelium*	*Neural*
Fissural cysts Nasoalveolar Median Globulomaxillary *Nasopalatine* Incisive canal Cysts of papilla palatina	Periodontal cysts *Dentigerous cysts* Odontogenic tumors Ameloblastoma Ameloblastic-epithelioma Enameloma Odontoma (epithelium only)	Adenocystic basal cell epithelioma Cylindroma Central carcinoma Dermoid cyst	Peripheral nerve tumors

Mixed Tumors (Ectoderm and Mesoderm)

Salivary Tissue Tumors Odontoma-mixed			

Mesoderm (Primary in Jaw)

Traumatic	Osseous	Connective Tissue	Odontogenic	Giant Cell Tumor
Localized osteitis fibrosa with or without cysts Traumatic cysts	Benign Hyperostosis Exostosis Torus palatinus Torus mandibularis Osteoma Fibrous osteoma Chrondroma & osteochondroma Giant cell tumors (osteoclasts) Malignant Osteogenic sarcoma various forms	Cementoma Dentinoma Fibroma-central Fibromyxoma Fibrosarcoma-central Angioma-central Endothelial myeloma (Ewing's tumor) Multiple myeloma Granulomatous diseases	Soft odontomas Giant cell epulis (odontoclasts)	Endothelial type

Metastatic (Secondary) Tumors

Ectoderm carcinomas	Mesoderm sarcomas

medial border of the mandible. Neoplastic processes in which new bone is laid down (osteogenic sarcoma), often produce a typical sunray appearance. This phenomenon was also seen in 1 of our cases of anaplastic carcinoma arising apparently in odontogenic rests in a boy aged 7 years.

Periosteal reaction, if any, is slight or none, around malignant tumors of the jaw (Ewing). Codman (1926) described the lifting of the periosteum at the edges of the growth as the "reactive triangle".

Osteomyelitis: When it is remembered that osteomyelitis, as a rule, attacks the organic substances in bone and inorganic salts are dissolved only to a small degree, it is easy to understand how a sequestrum is formed. Sequestra are not always present and occur only after the disease has progressed for a considerable time. The loss of bone substance gives an irregular, moth-eaten appearance in the roentgenogram, not always distinguishable from malignant disease, especially when the malignant process begins in the central part of the jaw. Periosteal reaction may be present in osteomyelitis of the jaws, as with osteomyelitis in other bones. In the roentgenogram, new bone is seen beneath the displaced periosteum. This type of periosteal reaction is seldom encountered with malignant neoplasms.

I. ECTODERMAL TUMORS PRIMARY IN THE JAWS

Congenital Anomalies.—Retained epithelial rests occasionally are found at the places of fusion of the various embryonic processes which go to make up the jaws. These epithelial rests grow to form cysts, which have been named "fissural cysts". They commonly occur around the anterior portion of the hard palate. *Nasoalveolar cysts* occur in the anterior part of the nostril or wing of the nose and are associated with swelling of the upper lip. *Median cysts* arise in the midline of the maxilla or mandible. *Globulomaxillary cysts* form at the junction of the globular and maxillary processes and occur in the alveolar bone between the roots of the second incisor and the canine teeth, causing them to diverge. *Nasopalatine cysts* form in the incisive canal and may occur in the center of the bone, where they are called "incisive canal cysts", or under the papilla palatina in the incisive foramen, when the name "cysts of the papilla palatina" is applied.

Tumors of Dental Epithelium.—During the development of the jaws, epithelial appendages develop from the basal layer of mucous membrane. These tooth buds produce the enamel organ which forms the crown of the tooth; the root of the tooth arises from the mesodermal tissue of the primitive jaw itself. Cysts from dental epithelium are true cysts, since they are formed from epithelium and lined by epithelium. Cysts seen in localized osteitis fibrosa and traumatic cysts of the jaws may be lined by epithelium secondarily growing from a fistulous tract.

Odontogenic cysts are true cysts arising from dental epithelium and are classified into four main groups; follicular, radicular, peridontal and dentigerous. In the roentgenogram a radiolucent area is seen with well defined, regular edges, with a characteristic white line caused by the cortical bone encapsulating it.

Follicular (primordial) cysts form during the developmental stage of the tooth and consequently occur in young patients. They may remain symptomless until later in life. These simple follicular cysts contain no teeth and are most commonly seen in the third molar region. The first symptom to call attention to the cyst may be expansion of the jaw without pain.

Radicular cysts (epitheliated granuloma) occur most commonly at the roots of the teeth, which differentiates them from follicular cysts and dentigerous cysts. They may occur at the lateral surface of the root. These cysts are thought to have origin in chronic infectious granulomas at the side or apex of the tooth. They occur in the maxilla as well as in the mandible. The cysts contain a thick, mucoid or watery thin fluid. They may be filled with granulation tissue. Cholesterin crystals may become abundant owing to tissue disintegration. In multiple cysts

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trabeculation may be seen, and if the edge of the cyst is irregular and moth eaten, adamantinoma must be borne in mind

Peridontal cysts may be either follicular or radicular The follicular cysts may develop from a partly erupted or retained tooth or from *supernumerary tooth germs* The radicular peridontal cysts develop similarly to the radicular cysts already described

Dentigerous cysts always contain the crown of the tooth, although the tooth may be widely displaced from its point of origin In the early stages there is no suggestive symptom other than the non eruption of the tooth Later, as the cyst grows, there may be expansion of the jaws, thinning the cortex sufficiently to produce a cracking sound when compressed because of the thin, parchment-like consistency of the cortical bone Evidently the enamel function of the tooth germ has ceased, as the crown of the tooth is usually fully developed

Treatment of all odontogenic cysts is surgical, the cyst is opened, the contents evacuated and the cyst wall curetted out *If a tooth is present, it must be removed* in order to cure the condition Likewise, if odontoma is present, the tumor must be removed

Odontogenic Tumors — Odontogenic tumors comprise those neoplasms arising from any portion of the tooth germ and histologically resembling either the mesodermal elements of the tooth root or the ectodermal elements of the enamel organ, or both

Ameloblastoma (adamantinoma) was first described by Malassez in 1885 The word "adamantinoma" is a bit misleading, as there is no enamel formed in the tumor More recently, the terms "adamantine epithelioma" and "ameloblastoma", which signify that the tumor *arises from enamel* organ epithelium, or the ameloblast, have come into common usage

The oral epithelium normally has the *potentiality of developing several different* types of adult structures, namely, squamous cells, mucous glands, salivary tissue, tooth buds (enamel organs) thyroid tissue and Rathke's pouch of the hypophysis Since the epithelium overlying the jaws and its several derivations all come from the same primitive epithelium, it is not uncommon to find all gradations of epithelial tumors, from ameloblastoma or *adenocystic basal cell epithelioma*, or salivary tissue, over to squamous cell carcinomas and other malignant growths The clinical picture of many ameloblastomas, adenocystic basal cell epitheliomas, and salivary tissue tumors in the jaw itself are often similar All of these tumors expand the jaw without ulceration, except after trauma or associated infection The main clinical difference between adenocystic basal cell epithelioma on the one hand and ameloblastomas and salivary tissue tumors in the lower jaw on the other is that the former (adenocystic basal cell) often begins with pain We have had 2 such cases of tumors in the lower jaws There was expansion of the bone, with pain and irregular bone destruction visible in the roentgenogram In both cases the mucosa healed after biopsy, a reaction not seen in the presence *of squamous cell carcinoma* We have had several cases of adenocystic basal cell epithelioma of the upper jaw, in which pain was not a common symptom.

As the enamel differentiates in the process of tooth development, three types of epithelial tissue develop The secreting cells next to the tooth become columnar, the outer layer of the enamel organ develops a rounded or oval epithelium, and the intervening cells become large, irregular and stellate Histologically an ameloblastoma always has two or three of these types of epithelial structures

There are five sources of origin commonly ascribed to ameloblastoma *(1)* malformed and supernumerary tooth *germs*, *(2) cells rests of the epithelial* sheath of Hertwig, *(3)* odontogenic cysts, *(4)* surface epithelium, and *(5)* displaced oral epithelium in other parts of the body

Clinical Behavior The symptoms of ameloblastoma are usually insidious There may or may not be a history of injury. The most common symptom is a slow, painless expansion of the jaw without ulceration, at times continuing as long as fifteen or twenty years. Now that the dental and medical professions are on the alert for this tumor, patients with adamantinomas are coming earlier for treatment. Ameloblastoma should be thought of when the roentgenogram of any odontogenic cyst shows a moth-eaten or soap-bubble appearance along the edge, especially when the odontogenic cyst is multilocular.

Ameloblastomas are much more common in the mandible than in the maxilla. Expansion is usually lateral, the lingual side of the jaw remaining almost normal until the tumor becomes large. The tumor is usually irregular in shape and large, frequently cystic, areas develop, the walls of which often crepitate on palpation because of the thinned-out bone, giving a derby-hat crackle. The eruption or noneruption of teeth is not constant enough to be a diagnostic sign. If the ameloblastoma began in a dentigerous cyst, then the crown of the unerupted tooth will be found in one of the cysts. Many of the patients have had teeth removed for various reasons prior to coming to one of the clinics.

Pathologic Observations: Ameloblastomas vary markedly in appearance. The monocystic type apparently begins in a dentigerous or odontogenic cyst. The affected jaw is expanded to varying degrees, depending upon the size and shape of the tumor. The cortex may be compressed to paper thinness and may crackle under pressure. The bone may be completely destroyed, but the periosteum usually remains. The solid tissue has a whitish, granular appearance, smooth and shiny. Cysts of varying size and shape usually are scattered throughout the specimen and contain a clear, yellowish, fibrinous or mucoid (sometimes colloid) material, so that the ameloblastoma tissue may not be discovered until careful microscopic examination of the wall of the cyst is carried out.

Histologic Picture: The microscopic appearance of the ameloblastoma is variable. Since the tumors arise from tooth germ epithelium, the histologic structure may resemble any one of the many stages in the development of the ameloblast. Most ameloblastomas arise after cell differentiation into the two or three types of epithelium; the tumors then resemble the several stages of development. Various combinations occur, namely, cuboidal epithelium and stellate cells, or tall columnar epithelium and stellate cells; or perhaps in some areas all three types may be represented. Eight different histologic varieties are described:

1. Epithelioma type: The epithelial cells show very little tendency to differentiate and remain more or less basal.
2. Stellate type: The epithelial cells are predominantly stellate, as seen in the enamel organ.
3. Ameloblastic type: Lobes and follicles are present which are made up of cells found in the third stage of development of the tooth germ.
4. Acanthoma type: This variety contains squamous or prickle cells with a tendency to form epithelial pearls.
5. Ameloblastic carcinoma: In these there is definite resemblance to carcinoma with large sheets of squamous cells, not unlike those seen in squamous cell carcinoma arising from the oral epithelium.
6. *Melanotic ameloblastoma:* Here there are typical ameloblastoma cells; also epithelial cells containing pigment.
7. Hemangioadamantinoma: This is a rare type that shows a histologic picture of ameloblastoma with large blood spaces filled with red blood cells replacing the stroma and appearing to be lined by cylindric tumor cells.
8. Adenoameloblastoma: In these tumors the epithelium is differentiated into glandular structures and arrangement, still retaining to some extent the appearance of an adamantinoma.

Roentgen Examination: Roentgenograms are not sufficiently accurate to allow an absolute diagnosis of ameloblastoma in every case. Since ameloblastoma and cysts that arise from dental epithelium have origin in the same embryologic anlage, the presence of ameloblastoma in an otherwise regular-walled dentigerous or follicular cyst should always be borne in mind. Large multilocular cysts of long standing are more apt to have ameloblastoma cells in their walls than are simple unilocular cysts. A small accessory cyst adjoining any odontogenic cyst should be looked upon with suspicion, as possibly containing ameloblastoma cells. Small areas of soap-bubble or honeycomb appearance or with a moth-eaten irregularity along the edge of the cyst, extending into the bone, are suggestive signs *of ameloblastoma. Some ameloblastomas* show no large cysts, but the whole involved area is made up of tiny cysts having the appearance of a mass of soap bubbles or a cross section of honeycomb. Teeth may be enclosed in one of the cysts or may be completely surrounded by tumor, or teeth may be displaced to a distance from their normal site. The roots of adjacent teeth may be denuded by pressure of the tumor, and there may be resorption of the surrounding alveolar bone. Central giant cell tumor and central myxofibroma are sometimes confused with ameloblastoma, as multilocular radiolucent areas are present with or without trabeculation, and because *either of these two* benign lesions may show irregularity of the cyst walls. Expansion of the jaw is more commonly associated with ameloblastoma than with myxofibroma or giant cell tumor. Ameloblastomas of short standing may not expand the jaw. Thoma has emphasized that myxofibromas have trabeculations that tend to form lines through the tumor instead of round compartments.

Prognosis: The outlook for most ameloblastomas is good, provided adequate and thorough treatment is given when the patient is seen early. Repeated curettage only serves to keep down the size of the growth and permits the patient to run the risk of malignant recurrences later. Smaller tumors not involving the entire depth of the jaw are resected intraorally with a wide margin of normal bone, giving a good cosmetic and functional result and also a good prognosis. Most of our patients have required radical operation, either because of the extent of the growth when first seen or because they have had repeated or conservative surgical treatment without permanent beneficial results.

Treatment: Our experience with patients having ameloblastoma treated conservatively over a period of years, plus *those patients who have refused radical* operation, has led us to believe that the best method of treatment is radical resection of the full thickness of the mandible with a margin of 1 cm. on each side *of the growth, except in cases of small* early tumors, in which a substantial portion of the lower edge of the bone can be saved, and leave a safe margin on all sides of the growth. This opinion is borne out by Simmons and by Ivy and Curtis. In most of our cases an extraoral approach has been required. The main objection of many surgeons and dentists to radical resection for ameloblastoma is based on the assumption that deformity and disfigurement result. These objections are outweighed by two facts: 1. Curettage and incomplete resection serve only to permit recurrences and run the risk, small as it may be, of malignant change in the *recurrences. 2. Modern surgery, including* bone grafting and the use of prosthetic appliances, reduces deformity and dysfunction to a minimum. Irradiation therapy has no place in the treatment of ameloblastoma.

Enameloma: These rare tumors are spoken of as enamel droplets or enamel pearls. They are found between the roots of two teeth and are more frequently attached at the bifurcation of the roots of molars and premolars, and at the cervical margin of single-rooted teeth (Thoma).

Roentgen examination shows an extremely radiopaque shadow without structure, the density being due to the hard enamel itself.

Odontoma: Odontoma is really a mixed tumor composed of ectodermal and mesodermal elements. Because these tumors form an intermediary group composed of ectoderm and mesoderm, they will be discussed after epithelial tumors.

Tumors Arising from Oral Epithelium.—As has been stated, there are epithelial appendages (ameloblasts) in the jaw expressly for the purpose of forming tooth buds. Various tumors may arise from maldevelopment of the tooth buds which resemble epithelial structures not found normally in the jaws, such as adenocystic basal cell epithelioma, cylindroma-like carcinoma, squamous cell carcinoma and salivary mixed cell tumors. The latter are discussed under mixed tumors.

Central Adenocystic Basal Cell Epithelioma: In our 196 cases of jaw tumors reviewed, 6 showed adenocystic basal cell epithelioma. The patients' ages varied from 51 to 60. There were 5 men and 1 woman. The symptoms were pain, swelling and disability in all 6 cases. The duration of symptoms varied from one to four years. Previous treatment had consisted of extraction of teeth in 4 cases and conservative surgical measures in 6. The pain, rapid swelling and disability should make one suspect the presence of a malignant tumor. Differential diagnosis is sometimes difficult from a clinical and roentenologic point of view. Although these symptoms are present at times with ameloblastoma, the pain is neither so common nor so severe; disability appears late, and the swelling develops much more slowly in cases of ameloblastoma. Metastatic carcinoma can be fairly well ruled out by an adequate history, general physical examination and roentgen studies. Three of the tumors were located in the upper and 3 in the lower jaw.

The roentgenogram showed a characteristically moth-eaten, diffuse, destructive process throughout the bone. In 2 of the cases an early diagnosis of osteomyelitis was made. In 1 the presence of a sequestrum was suspected. In the other there was diffuse honeycomb formation in the bone. This honeycomb appearance was due to small cavities in the bone filled with tumor cells. Histologically the picture was that of basal cell epithelioma or cylindroma.

Treatment is radical operation, with resection of the lymph nodes in the neck followed by postoperative irradiation unless a very wide margin has been given. Two of the 6 patients lived one year; 3 lived three years, and the third could not be followed.

Central Squamous Cell Carcinoma: Since epithelial cells grow down into the jaw from the surface, it is not surprising that true squamous cell carcinoma is encountered in the jaw, possibly owing to metaplasia. Fortunately these tumors are rare. The presenting symptoms are pain and swelling with disability. The duration of symptoms is from one to two years. On examination ulceration and infiltration of the surrounding tissue are noted. The roentgenogram shows a radiolucent shadow with ragged edges and no new bone reaction. Treatment consists of radical operation with radical dissection of the neck. In our 2 cases of central squamous cell carcinoma the patients lived two and three years, respectively, after operation, and then both died of pneumonia.

Dermoid Cyst: Dermoid cyst of the mandible is apparently a rare occurrence, as we know of none reported in the literature and have observed only 1 in our own experience. The only symptom was a painless lump in the right mandible just inside the mouth, first noticed twenty-four years previously. There was gradual growth until a year prior to admission, when growth became more rapid. The roentgenogram showed a solitary radiolucent oval area with clear-cut regular edges and no new bone reaction. Treatment was operative removal. Recovery was uneventful.

Tumors of Peripheral Nerve Origin.—These tumors are rare. We have observed 1, similar to the tumor described by Lanford and Cohn in 1927 and by Cohn in 1928. The tumor occurred in a white boy aged 5 years and had been diagnosed previously as Ewing's tumor. It was resistant to irradiation. Subsequently radical resection was done, but the tumor promptly re-grew and did not respond notably to any further treatment. The patient died.

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Histologically the tumor contained epitheloid glandular structures.

II. CENTRAL MIXED TUMORS

Central Mixed Tumors of Salivary Tissue.—The presence of these tumors in the jaw is theoretically due either to embryonic rests or to metaplasia of epithelial appendages. Most salivary tissue tumors in the mouth occur on the soft or hard palate, or along the gingival borders in the mucous membrane itself. Formerly this type of tumor was regarded as a carcinoma of the adenoma type. The tumor develops in the bone without subjective symptoms. Later there may be swelling of the cheek or face. Pain—neuralgic, burning or shooting—has been reported owing to involvement of the nerves or pressure against them.

Roentgenograms of central mixed tumors show a cystic region of varying outline. Coarse septa extend from the periphery into the tumor for a short distance and are likely to be variable in shape, often expanding irregularly instead of running out to a point. Calcified trabeculae may be found in the center, which are partly calcified connective tissue structures formed in the tumor itself (Thoma).

The histologic picture is that of a mixed cell tumor of salivary tissue; that is, there are varying components of glandular epithelial and connective tissue. Treatment is surgical. Mixed tumors of salivary tissue in the mouth, as elsewhere, are radioresistant.

Odontoma: This is often a mixed tumor composed of ectodermal and mesodermal elements. Strictly speaking (based on the classification given here, i.e., separation of all tumors according to their origin from ectoderm or mesoderm), odontomas should be divided into three groups: The simple ones, composed of only one dental tissue, mesoderm or ectoderm, and the mixed or composite variety composed of both. The results of roentgen study are of great importance because of the large amount of calcification in the tumor. Early discovery by roentgen examination allows prompt removal and may prevent occlusal disturbance later. The roentgen picture will vary according to the type of odontoma. There are very dense, irregular, mottled shadows, evidence of the various types and stages of tooth development. Such a tumor may or may not be cystic. Cystic odontomas can be differentiated from dentigerous cysts by the presence of poorly formed teeth; whereas in a dentigerous cyst the normal crown of a tooth is present. The histologic picture is that of a conglomeration of various types of tooth elements, mixed in orderly or disorderly fashion. Enamel, dentine, cementum, soft tissue (such as enamel epithelium) and peridontal tissue are found in the tumor.

Odontomas are benign and are excised by conservative surgical methods. Recurrences have not been reported.

III. TUMORS OF MESODERMAL ORIGIN: *REACTION TO INJURY*

Localized Osteitis Fibrosa With or Without Cysts.—Localized areas of painless swelling in the maxilla not caused by generalized disease (hyperparathyroidism) or derived from dental epithelium are not uncommon in the jaws. In these cases of localized osteitis fibrosa the levels of serum calcium and plasma phosphorus are normal. There is no generalized osteoporosis, and if cysts are present they do not have the epithelial lining observed in cysts of odontogenic origin. Geschickter and Copeland (1949) pointed out that the disease is probably preceded by a destructive process which becomes arrested or may progress without marked symptoms. At operation the bone-destructive phase is almost complete or has been replaced entirely by the healing stage. According to Thoma (1944), these occur in patients less than 21 years of age and more frequently under the age of 15 years. We have had several patients who are older, being in the third and fourth decade. In the older group there was a history of onset associated with the extraction of teeth. It is difficult to determine which came first, the swelling
of infected teeth. If t

it would seem that in the older group osteitis fibrosa was due to an excessive reparative phase after infection. According to Geschickter, the more cellular growths occur in patients under the age of 20 years. He agrees that they may be associated with infection or trauma or may arise spontaneously. The clinical history is usually that of a painless but slowly increasing swelling of the upper and lower jaw. In our cases, the duration varied from a few months in the younger age group to four or five years in the older patient. The more cellular growths in the younger patients may be termed "ossifying fibromas". In the older group, the adult bone becomes more compact and may be classed as "osteomas" (Geschickter). The treatment is surgical removal. Recurrence is not uncommon, particularly if surgical removal has not extended beyond the pathologic process and included some of the normal surrounding bone. Cysts may or may not be present. When they are present, the term "osteitis fibrosa cystica" is usual. Roentgenograms depict expansion of the bone, with or without radiolucent areas (cysts). The density of the tumor in the bone, as seen in the roentgen film, varies between the density of normal cancellous bone and normal cortical bone. The fibrous tissue intervening between spicules makes the shadow less opaque than the solid cortical bone nearby. There appears to be more bone, however, in the tumor than in normal cancellous bone, and therefore the shadow is more opaque than areas of normal cancellous bone in the same film.

Traumatic Bone Cysts.—Etiologically, traumatic cysts are closely related to osteitis fibrosa cystica but deserve a special classification because of the different pathologic picture. In our 1 case the patient stated that she had fallen and displaced the right central and lateral incisors posteriorly several months prior to consultation. There was no particular swelling of the cheeks at that time. The swelling appeared rather suddenly while she was wearing an orthodontic brace and was noticed by her sister as they sat at the dinner table. There was no pain and no discoloration of the cheek. The patient was treated by incision of the cyst and permanent drainage. Gradually the cyst diminished, permitting complete removal of its lining. By degrees, after several years the asymmetry of the face disappeared as the normal side grew out to equal the affected side.

Pathogenesis: Thoma, who cited Schneider and Blum, expressed the opinion that these cysts are caused by trauma in soft bones where fracture does not occur. There is interosseous hemorrhage, sometimes extensive, due to the exceeding vascularity of the jaws. These cysts occur more commonly in the lower than in the upper jaw. The cortex is but rarely affected and generally not expanded. Roentgenograms show a cystic area of irregular outline. In our case the outline was fairly definite, with a well-defined edge. The roots of the teeth may be involved, so that a differential diagnosis from a radicular cyst must be made. Incision and curettage of the entire cyst wall, followed by packing with suitably medicated (e.g., iodoform gauze) stimulates granulation and healing.

Osteogenic Tumors.—Osteogenic tumors in the jaws resemble osteogenic tumors in other bones of the skeleton and are not common. Benign bone tumors are more frequently encountered than malignant bone tumors.

Benign Osteogenic Tumors: Hyperostosis is an enlargement of part or all of the mandible or the maxilla. Such hyperostosis occurs in Paget's disease, acromegaly and leontiasis ossea. In these diseases both jaws are usually affected. Local hyperostosis may occur unilaterally or may involve only a small portion of the maxilla or the mandible; it is thought by some to be due to inflammation or trauma. In most of our cases there has been a history of the removal of teeth at the time of onset of the swelling of the jaws. These swellings commonly grow to definite size and then stop. Pain is seldom present.

Exostoses and Enostoses: Exostoses are very common and occur most frequently at the insertion of the muscles and tendons (Thoma) or at the junction of two bones, such as the palatal processes of the maxilla. To exostoses in this location the term torus palatinus is given. Torus mandibularis applies to exostoses on the mandible. It is important to differentiate these tumors from malignant growths. Roentgen examination reveals a radiopaque dense shadow in the middle of the palate or on the mandible (torus mandibularis).

Enostoses are hard bony tumors growing into the central portion of the jaw from the cortex. Thoma differentiated these from endosteoma by suggesting that in the former the tumor emerges imperceptibly into the surrounding spongiosa, whereas the latter are more likely to be demarcated by a connective tissue capsule, which is seen as a dark line separating the ingrowth from the spongiosa. In our series of bone tumors of the jaws all of these exostoses and enostoses were described as osteomas because of the histologic picture. In the roentgenograms, enostoses appear as dense, radiopaque shadows within the jaw.

Osteomas: Osteomas occur in the jaws, as in other bones of the skeleton. They may be peripheral or central; the latter are spoken of as endosteal osteoma.

As to their pathogenesis, Thoma has suggested that development may occur from any part of the maxilla or mandble and arises from preformed bone periosteum or retained cartilage cells from the embryonic chrondral skeleton. Clinical signs and symptoms of osteoma are due to mechanical changes caused by the size of the growth. Small ones may remain unnoticed for an indefinite period. Large osteomas cause marked disfigurement of the face. Osteomas are hard, circumscribed, and often irregular in shape, although they may be rounded and smooth. In our 196 cases of tumor of the jaws there were 17 osteomas, the patients varying in age from 11 to 60; 13 occurred in persons aged 31 to 50.

Treatment consists of surgical removal unless the tumor is asymptomatic. Large tumors cause some disfigurement and dysfunction. Prostheses or plastic repair, or both, may be required.

Fibrous Osteoma: This benign osteogenic tumor has been described under a number of terms: localized osteitis fibrosa, localized osteodystrophia, ossifying fibroma, fibrous osteoma, osteofibroma, hypertrophic localized osteitis and osteoid osteoma. The terms "osteitis fibrosa" and "hypertrophic localized osteitis" naturally imply the association of infection, or at least inflammation. There is little evidence to show that these conditions actually occur on an infectious basis. We prefer the term employed by Phemister and Grimson (1937), "fibrous osteoma", which indicates some localized bone disease related to tumor formation. In the opinion of these authors this type of growth is related to membranous preformed bone, as benign cartilage tumors and exostoses are related to cartilaginous preformed bone.

Histopathologic Picture: Microscopically, there is a mixture of fibrous tissue and new bone trabeculae.

Clinical Data: These tumors produce a varying degree of facial deformity, depending upon the location and size. In our series of 196 tumors of the jaws, 9 were diagnosed as fibrous osteoma. One occurred in a child under 10 years of age; 4 in persons between the ages of 11 and 20; 2 in persons between 21 and 40, and 2 in patients between 51 and 60.

Roentgen Data: In the roentgenogram there is an area of radiopacity of varying density, depending upon the amount of bone spicules scattered throughout the tumor. A larger amount of fibrosis lessens the radiopacity. There is no periosteal formation and no well-demarcated line at the edge of the growth. Some types contain well-defined cystic areas; to these the name of "osteitis fibrosa cystica" may be applied. The usual density in the roentgenogram lies between the density of cancellous bone and that of cortical bone.

Treatment: Fibrous osteomas involving the maxilla are treated by surgical intervention combined with intra-antral application of radium. This procedure was suggested to us several years ago by Murray M. Copeland, who was working in our clinic at the time. Three of our patients have responded very well to this treatment. The antrum is opened through the mouth and radium tubes are inserted. An average dose of between 1,500 and 1,800 milligram hours is given. Local areas of osteitis fibrosa in the mandible are resected with a safe margin.

Chondroma and Osteochondroma: Cartilaginous tumors of the jaws are rare. They may be chondromas, osteochondromas, or occasionally rapidly-growing chondromyxosarcomas.

Clinical Behavior: The symptoms are pain, swelling and disability, depending upon the location.

Roentgen Data: On account of the small amount of tissue, true chondromas are usually radiolucent. The presence of bone tissue in the tumor casts a peculiar spotted shadow in the roentgenogram. There is absence of periosteal reaction.

Treatment: Surgical excision, including a zone of normal surrounding bone, is the treatment of choice.

Central Giant Cell Tumors: In our study of 196 cases of tumors of the jaws, 62 were diagnosed as giant cell epuli. Three of these were central and 59 were peripheral. Central giant cell tumors are uncommon in the jaws.

Pathogenesis: Geschickter and Copeland have shown that central giant cell tumors of the jaws are associated in their origin with areas of bone development through intermediary cartilaginous ossification. The giant cell tumors in the mandible also apparently arise from embryonic rests of Meckel's cartilage.

Histologic Picture: As in the giant cell peripheral epulis, these tumors viewed under the microscope are seen to be made up of multinucleated giant cells in a stroma of round and spindle-shaped cells. In 1 of our cases the giant cells seemed to spring from the endothelial lining of the blood vessels.

Clinical Signs: Central giant cell tumors grow more rapidly and destroy bone more extensively than do peripheral epulis. There is expansion of the bone to a thin shell. The mucous membrane may be discolored to a dark purplish hue, if the tumor is vascular; and most of these are vascular.

Roentgen Examination: The roentgenogram shows a central radiolucent single or multiloculated expansion of bone with a thin shell. Trabeculations vary in size and often extend throughout the tumor. Often it is difficult to differentiate between a giant cell tumor and a single or multilocular benign cyst.

Treatment of giant cell tumors is conservative. Electrosurgical removal often suffices to bring about a cure. Often it is possible to preserve teeth scattered near the tumor area, especially in young patients when the permanent teeth have not yet erupted. When the tumors extend into the temporal fossa or high into the maxilla, local removal should be followed by irradiation, as it is impossible to resect or destroy such extensive growths electrosurgically.

Malignant Osteogenic Tumors.—Osteogenic Sarcoma: Malignant bone tumors of the jaws are fortunately very rare, as evidenced by the fact that our 196 cases included 1 osteogenic sarcoma, 2 osteochondrosarcomas and 2 myxochondrosarcomas.

The clinical pictures of various forms of osteogenic sarcoma are similar—pain, swelling and disturbance in mastication, varying in duration from one month to two or three years.

The roentgen observations suggest the possibility of malignant tumor. The amount of radiopacity will depend on the amount of new bone laid down and the amount of bone destroyed. The radial spicules of bone laid down by osteogenic sarcoma (sun-ray effect) are not always present in osteogenic sarcomas of the jaws. The diagnosis is made by biopsy.

Treatment is very wide and extensive resection.

As to prognosis, the ultimate result in treatment of osteogenic sarcomas of the jaw is not good.

Connective Tissue Tumors. — Jaw

tumors of mesenchymal origin that are nonosteogenic include cementoblastomas, central fibroblastomas, both benign central fibromas and fibrosarcomas, fibromyxoma, central neurogenic tumors, central angiomas, Ewing's tumors, multiple myeloma, and eosinophilic granuloma. As the last three diseases are more or less general bone diseases, and as time and space are limited, their discussion in detail will be omitted from this work.

Cementoblastoma, Cementoma (Periapical Fibroma): These tumors are fairly common and are formed of a cellular stroma, the active and primary part of the neoplasm. Stafne (1934) has traced the development of cementomas from masses of connective tissue at the root ends of vital normal teeth as the result of proliferation of connective tissue of the peridontal membrane. These tumors are frequently multiple, remain rather indefinitely as a translucent area in the roentgenogram and may be confused with dental granulomas or cysts. When the diagnosis of cementoma is made, teeth may be saved; whereas they would be extracted if multiple granulomas or cysts were present. In most cases cementicles are formed in the connective tissue to such an extent that the cementum almost completely replaces it.

Roentgenographic examination is diagnostic; there are three stages, according to Thoma: (*1*) the osteolytic stage; (*2*) the cementoblastic stage, and (*3*) the mature inactive stage, when calcification is complete but there is still a thin dark area around it, indicating that the soft part is now merely a remnant of inactive tissue.

Treatment is surgical removal when the tumor becomes large. In most cases no treatment is indicated, for the tumors are slow in growing, becoming stationary and apparently remaining innocous for an indefinite period.

Fibroma (Central Fibroma): These tumors are rare. In our series of 196 cases there were 9 fibromas, 3 of which were centrally located.

Roentgenographic Data: The roentgen picture is that of a very diffuse, ill-defined lesion, with greater density than the surrounding bone. An odontogenic central fibroma, which usually has a cystic formation and is closely related to a tooth, must be differentiated from ordinary central fibroma.

Histologically, the tumor is characteristic of a fibroma containing fibroblasts and collogen fiber bundles.

Although the treatment of central fibroma is usually conservative, consisting of enucleated and chemical cauterization or electrosurgical treatment, one must be on the lookout for possible recurrences and later development of fibrosarcoma.

Fibromyxoma: Thoma classified these under true osteogenic tumors. If they develop from osteogenic tissue, they must arise from early embryonic cells still in the preskeletal form. Both of our patients were young women, 17 and 19 years of age.

Both complained of a painless swelling in the jaw.

Roentgenologically there was a large, multilocular, radiolucent shadow, involving most of the posterior third of the ramus, in 1 case extending beyond the midline anteriorly. There was some trabeculation, and a few areas suggested a honeycomb appearance, making it necessary to rule out ameloblastoma.

Under the microscope these tumors are found to be composed of stellate cells of long processes and other cells, triangular or cuneiform. These cells are contained in a mucoid matrix made up of fine fibrils, composing the delicate meshwork.

Treatment is local resection of the jaw, with a wide margin of safety. In both of our cases conservative treatment (curettage) was carried out first, but both tumors recurred, requiring resection of the jaw. In 1 the resection was done subperiosteally, and in three months enough bone had regenerated to make the jaw solid. The patient wears a prosthesis. In the other the recurrence was complicated by secondary infection e bo d expanded to such an extent that resection of the periosteum was necessary. A subsequent bone graft gave a good result. At the time of writing both of these girls are married; 1 is now a mother.

Central Fibrosarcoma: Under this heading are included fibrosarcomas of nonosteogenic origin which are of the fibro-spindle cell type. These tumors are rare but should be borne in mind in the differential diagnosis of malignant central tumors of the jaw. These tumors also are to be differentiated from peripheral fibrosarcoma invading the bone from without.

The symptoms are pain and swelling in the affected part, with corresponding disfigurement and dysfunction.

Roentgenographically the tumor is osteolytic in its action and produces a radiolucent area which, on account of its infiltrating character, possesses an indistinct margin. The cortex may be destroyed when the tumor is sufficiently large and without evidence of periosteal activity, as in osteogenic sarcoma.

Histologically the tumor cells are spindle-shaped or oat-shaped, and in some cases may acquire considerable cytoplasm.

The treatment is radical dissection of the jaw, with a wide margin of surrounding soft parts.

Neurogenic Fibrosarcoma: These tumors, like the fibrosarcomas just described, are rare and may simulate histologically the various types of neurogenic fibrosarcoma.

The clinical and roentgenologic features are similar to those described for fibrosarcoma.

The treatment is radical resection of the jaw and adjacent soft parts.

Central Angioma: This is a rare tumor and is to be distinguished from angioma of the vessels of the periosteum or the oral mucous membrane which invade the outer surfaces of the jaws. The central aniomas form in the marrow or spongiosa.

The symptoms are not particularly characteristic. The tumors are slow in development and are benign. A few have been reported as developing rapidly. Pain is a frequent symptom and may be pulsating. Large tumors expand the bone, causing facial disfigurement.

Roentgen examination reveals small multilocular radiolucent areas resembling the so-called "soap bubble" effect. The bone is expanded in a manner similar to that associated with giant cell tumors. There is a fine fibrillar network within the cystic cavities.

The histologic picture is that of cavernous or capillary angioma.

The treatment is ligation of the major artery or arteries supplying the tumor. Preoperative and postoperative roentgen therapy has been used to sclerose the blood vessels.

Odontogenic Mesenchymal Tumors.—Soft Odontoma: The soft odontoma may be of a mesenchymal origin alone, without evidence of dental epithelium. The signs and symptoms have been described.

Benign Giant Cell Tumors.—These tumors may be peripheral, when they are often called epulis and central giant cell tumors. The latter have been described.

Giant Cell Epulis or Peripheral Giant Cell Tumor: These tumors appear most frequently in children and young adults between 10 and 20 years of age or during the period of eruption of the permanent teeth, and usually they occur near the canine, bicuspid or incisor teeth and also about the roots of those permanent teeth which are preceded by deciduous dentition (Geschickter, 1935). These growths are to be distinguished from so-called "fibrous epulis" and peripheral fibroma. The former are really sclerosed granulomas; the latter are true tumors. Giant cell epulis arises from pericementum or alveolar dental periosteum. They are related to the normal proliferation of odontoclasts occurring in the cementum about the roots of the deciduous teeth.

Under the microscope the tumors are seen to be made up of many multinucleated giant cells in a dense fibrous stroma. There is no inflammatory reaction. In 1 of our cases the giant cell tumors appeared to come from the endothelial lining of the blood vessels.

Clinically there is localized swelling without other symptoms The tumor is soft, sessile or pedunculated, and deep red or mottled It bleeds on slight trauma

Roentgenographically there is no invasion of bone, but the bone may be destroyed by pressure, leaving smooth, lobulated, radiolucent areas

The treatment is wide surgical excision with chemical or thermal cauterization In our hands electrosurgical removal, with electrodesiccation or mild electrocoagulation of the base, suffices to cure Occasionally we have applied radium after electrosurgical removal Curtis Burnam (personal communication) held that these tumors were quite radiosensitive Kazanjian has said that giant cell epuli are highly resistant to irradiation It is our opinion that electrosurgical removal is preferable to irradiation, as there is less damage to underlying bone and less likelihood of late destruction of the teeth from obliterating endarteritis

IV MALIGNANT TUMORS METASTATIC TO THE JAWS

Secondary involvement of the jaws from malignant disease elsewhere in the body is not common The diagnosis of such metastasis must be made by the exclusion of primary jaw tumors, confirmed by a careful search for a primary focus and then substantiated by histologic examination Carcinoma metastatic from lip, breast, lung, prostate gland, stomach, thyroid gland, hypernephroma, adrenal gland, etc , has been reported

Clinically the symptoms are those of any other malignant tumor of the jaws There may be rheumatoid pain and other neurologic manifestations, due to pressure on the nerves within the jaws Systemic symptoms due to the primary focus develop sooner or later

The roentgen picture is that of other malignant neoplasms of the jaws Radiolucent areas may be irregular in shape, owing to invasion of the bone The amount of destruction depends upon the disease process

Treatment is palliative and symptomatic

SUMMARY

The authors present an exhaustive study of tumors of the jaws, classified into (1) ectodermal tumors primary in the jaws, (2) central mixed tumors, (3) tumors of mesodermal origin and (4) malignant tumors metastatic to the jaws The roentgen characteristics of all types are discussed and the treatment outlined

ZUSAMMENFASSUNG

Die Arbeit besteht aus zwei Teilen und gibs eine erschoepfende Eroerterung und Analyse der klinischen Aspekte von 534 Faellen von Kiefergeschwuelsten Der erste Teil beschaeftigt sich mit den beiden Hauptformen der primaeren Kiefergeschwuelste, naemlich den von Ektoderm und den vom Mesoderm entspringenden Der zweite Teil ist der Untersuchung der weniger haeufigen Form, der Michgeschwulst, gewidmet, die sowohl ektodermale als auch mesodermale Elemente aufweist Erwaehnt werden auch die nicht haeufigen aber doch gelegentlich auftretenden metastatischen Geschwuelste, die in Faellen von Karzinom oder Sarkom in anderen Koerpergegenden beobachtet werden In diese letzte Gruppe sind gutartige und boesartige Geschwuelste, die in die Kiefer von angrenzenden Geweben eindringen, eingeschlossen Diese Kategorie zerfaellt in Unterabteilungen, die fast alle im Kiefer vorkommenden Geschwuelste umfassen

RESUME

Ce rapport tres complet de 534 cas de tumeur de la machoire, comporte deux parties, une discussion et une analyse des aspects cliniques de cette lesion La premiere partie de la discussion se rapporte a deux types de tumeurs primitives de la machoire, celles naissant de l'ectoderme et celles des mesodermes Le seconde partie du travail s'applique surtout a l'etude d'un type de tumeur moins frequent, la tumeur mixte, qui presente des

expanded to such an extent that resection of the periosteum was necessary. A subsequent bone graft gave a good result. At the time of writing both of these girls are married; 1 is now a mother.

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Etiology of Strictures Occurring After Prostatic Operations

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THE objectives of the surgical treatment of prostatism are to remove the urinary obstruction as safely as possible and to restore a urethral channel that will function properly and permanently Modern technics, improved anesthesia, adequate blood banks, a better understanding of fluid balance and the rational use of antibiotics have lowered the mortality statistics of prostatic surgery to the almost irreducible minimum obtained with other major operations on patients in a similar age group There is, however, need for further improvement in the completeness and permanence of functional results [1]

Last year we appraised the end results of prostatic operations urethrocystographically and demonstrated that this roentgen method of examination was easily executed, was free of complications and produced important diagnostic information that often was unobtainable by other means The various structural deformities following prostatectomy were graphically portrayed and permanently recorded Many latent lesions of the urethra, vesical neck and prostatic bed were found to occur particularly in patients with persistent postoperative symptoms The report, which was based on the results of more than 300 roentgenographic examinations of patients who had had every kind of prostatic operation, concluded that urethral strictures form after every type of prostatectomy and that these strictures are the most frequent feature of the unsatisfactory functional result The postoperative strictures in this group were catalogued on the basis of their location and their causes, and the present paper is the result of our clinical and roentgenographic studies

This report is not statistical, and the strictures visualized here are incidental to a large series of prostatectomies extending over twenty years In many cases the patient's condition was the unfortunate result of urologic treatment elsewhere, and he had gravitated to our clinic in search of relief

The indications and contraindications, the opaque media, and the urethrographic technic, which employed a specially designed urethrographic instrument, have been previously reported [2] The roentgenologic anatomy of the urethra and the urethrographic observations in the presence of prostatism, including a classification of prostatic obstruction, have also been previously described [3]

The presence of strictures after operation is a source of embarrassment to the urologist, and every effort should be made to establish the nonexistence of such strictures prior to surgical intervention Strictures, especially those resulting from infection, sometimes take years to develop, and the connective tissue replacement of the urethral linings may have been present long before the advent of prostatism The ultimate contraction of these scars cannot be avoided The urologic adage that stricture and prostatic enlargement do not occur in combination is a fallacy Andre[4] found that 4 per cent of a series of 300 patients with prostatic hypertrophy had urethral strictures with a caliber less than 18F A preoperative urethrogram will disclose their presence and

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éléments ecto et mésodermiques. Même si l'évidence est rare, il est fait mention de cette tumeur occasionnelle métastatique amorcée à un sarcôme ou à un carcinôme situe ailleurs dans l'organisme. Cette dernière classification comprend les tumeurs bénignes et las tumeurs malignes qui envahissent la mâchoire par propagation des tissus mous avoisinants. Cette classification est détaillée davantage afinde permettre d'y inclure tous les types possibles de néoplasme que l'on peut rencontrer dans la mâchoire.

RIASSUNTO

Questa e' una discussione esuaribile a due parte ed analisi degl'aspetti clinici di 534 casi di tumori delle mascelle. La prima porzione della discussione e' consegnata a due tipi principali di tumori primarii delle mascelle, cioe', quelli derivati dell ectoderma e quelli del mesoderma. La seconda parte della ricerca esamina un tipo meno comune, tumore misto, che ha entrambi elementi ectodermali e mesodermali. Benche' non sia comune, si fa menzione del tumore metastatico occasionale associato con carcinoma o sarcoma altrove nel corpo. Questa classificazione tardiva include tumori benigni o maligini che invadono le mascelle da tessuto molle adiacente. La categoria e ancora distrutto per includere quasi tutti tipi di neoplasmi alla quale la mascelle e' suscettibile.

RESUMEN

Se discuten y analizan los aspectos clínicos de 534 casos de tumor de los maxilares. Se dedica la primera parte de la discusión a los dos tipos principales de tumores primarios de los maxilares, es decir, los ectodérmicos y los mesodérmicos. Se examina en la segunda parte un tipo menos común, el tumor mixto, que tiene tanto elementos ectodérmicos como mesodérmicos. Aun cuando no es común, se hace alguna mención del tumor metastásico ocasional asociado con carcinoma o sarcoma en otra parte del cuerpo. Esta última clasificación incluye tumores benignos o malignos que invaden los maxilares del tejido blando adyacente. Además, se trata de incluir en la categoría casi todo tipo de neoplasma del cual sea susceptible el maxilar.

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sclerosis causes loss of elasticity in the involved areas of the urethral wall and appears on the urethrogram as pronounced narrowings which may encircle the urethral channel, or as notches which may involve only part of the urethral circumference. Comparison of the postoperative with the preoperative urethrogram will often show irregularity of the outline and marked diminution in the width of the anterior urethra. This may be limited to only a portion of the urethra or may extend throughout its length (Fig. 3).

Meatal: The urethral meatus is an anatomic area which is often overlooked; dribbling and narrowing and forking of the stream are frequently due to strictures in this area. The scarified meatus has occasionally contracted to such an extent that it is difficult to insert the meatal tip for urethrographic procedures.

Extrinsic.—Periurethral: External scarformation can surround the urethra and produce narrowing of the canal. The bulbous and bulbomembranous urethra are the regions most susceptible to damage by instruments and are frequent sites of periurethritis and stricture. Instrumentation injures the superficial tissues sufficiently so that hydrodynamic pressure forces fluids into the surrounding tissues and sets up periurethral infection. Residual scar tissue remains after drainage of the abscess and leads to eventual stricture (Fig. 4).

Perineal: Marked infection or urinary irritation of the tissues of the perineum following prostatectomy leaves extensive scarification which frequently involves the exterior of the membranous urethra. This is especially prone to occur when the pathologic condition is in the deep perineal compartment. The fibrous tissue eventually contracts and constricts the canal. Distally, a portion of the bulbous urethra may be involved; proximally, the external sphincter may be fixed by scar and its efficiency thereby affected (Fig. 5).

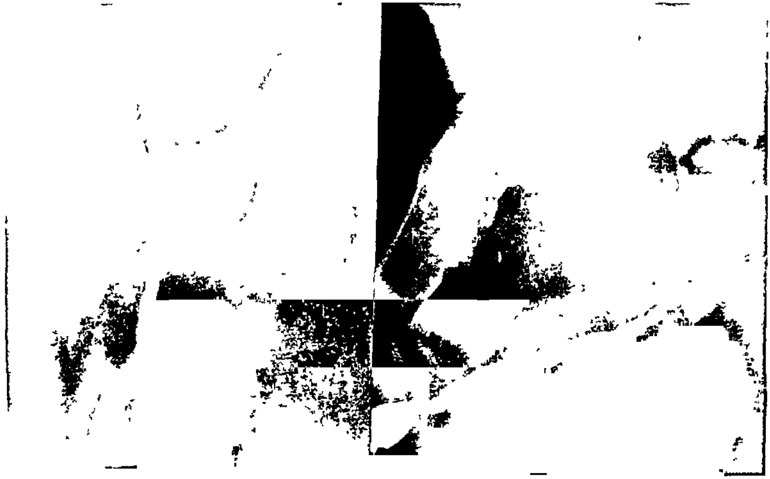
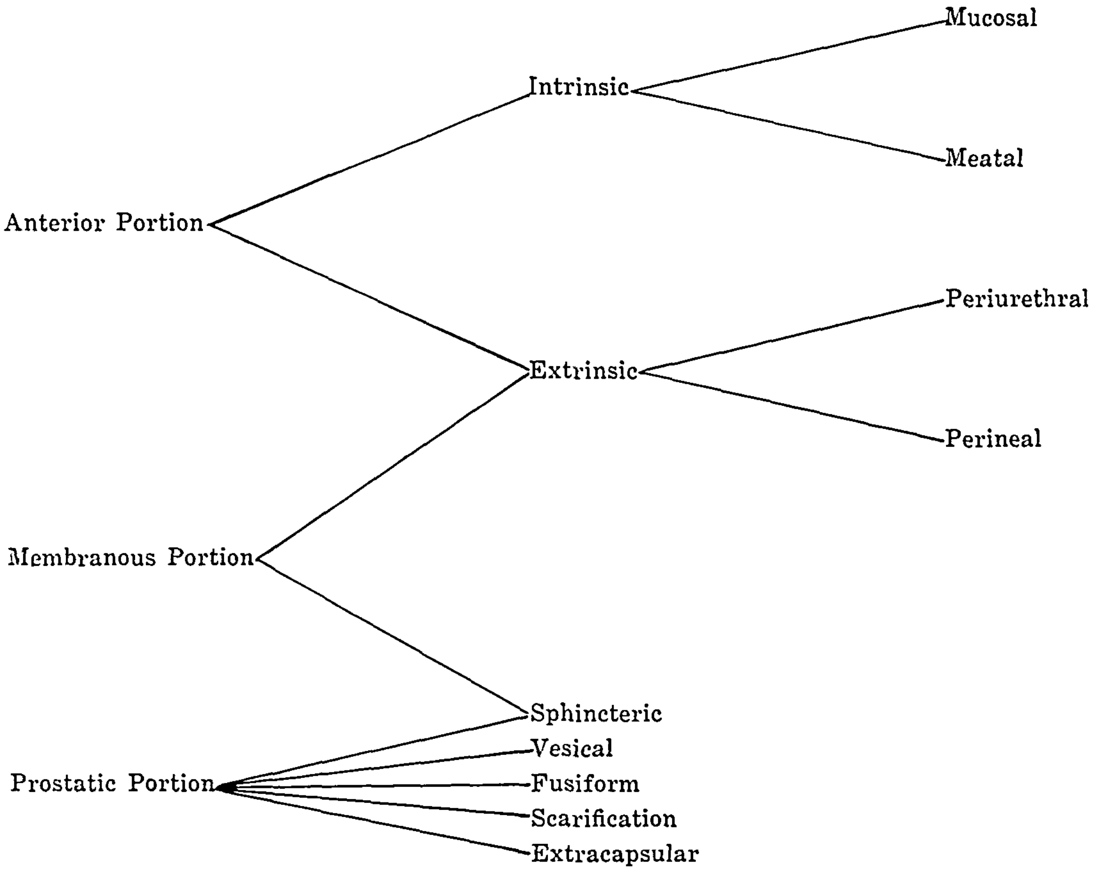


Fig. 1.—Hypertrophied prostate and urethral stricture. L. S., aged 53, with a history of urethritis thirty years ago. No treatment administered for strictures. The patient had symptoms of prostatism for one year. Note the marked elevation of the bladder base and the constrictions in the bulbous portion of the urethra.

CHART 1.—*Postprostatectomic Urethral Strictures* (*Urethrocystographic Classification*)



also demonstrate prostatic obstruction (Fig. 1). The relation of symptoms to the stricture should be evaluated and the patient told of the need of periodic and continuous urethral dilatations after prostatectomy.

There are various methods of classifying urethral strictures, but for the sake of conciseness and clearness we are using only two criteria for presenting this postoperative group. The first classification is anatomic and is based on the roentgen changes on the urethrogram. The second group is clinical and is based on the etiologic factors.

Urethrocystographic study will delineate the number, character and length, as well as the sites, of the postoperative strictures. We have used the latter factor as the basis of classification, since it is the most important from the functional standpoint. Postoperative strictures may be multiple and frequently coexist with other abnormalities (Fig. 2).

STRICTURES OF THE ANTERIOR URETHRA

Constrictions in the anterior urethra may be intrinsic and due to actual pathologic changes in the walls of the canal, or may be extrinsic and secondary to external scar contracture.

Intrinsic.—Mucosal: Overdilatation of a normal urethral canal of small caliber, inadequate lubrication and the rough and frequent passage of instruments often traumatizes the delicate mucosa sufficiently to produce strictures. The resulting

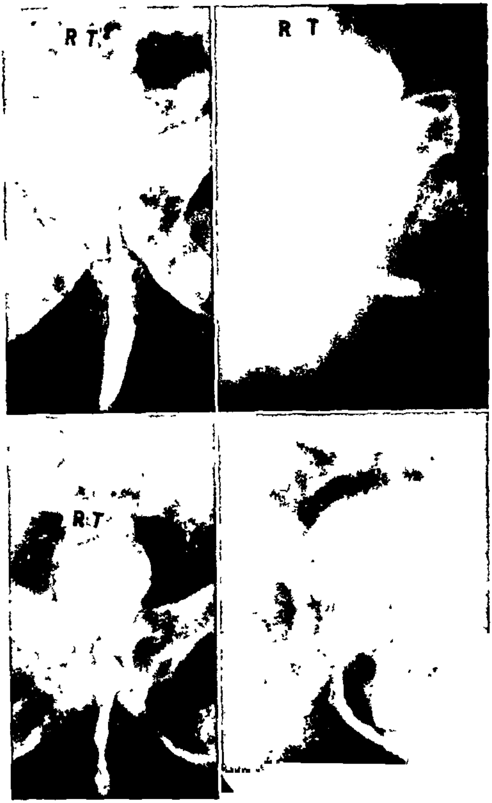


Fig. 3—Comparative roentgenograms, preoperative and postoperative, of R. T., aged 55. Above, anteroposterior and oblique views prior to transurethral resection. Below, two views showing the status of the same canal taken from the same views one year later. Note the narrowing throughout the anterior urethra on the postoperative urethrograms.

not descend on straining but remains fixed, and the vesical neck does not dilate but remains rigid and narrow.

E. Extracapsular.—Perforation of the prostatic capsule, undermining of the trigone, and resection through the bladder neck fibers are occasional complications of prostatectomy. These lesions may respond satisfactorily to appropriate emergency treatment which prevents exodus but often leaves sequelae in the form of stricture and massive scarification.

STRICTURES OF THE MEMBRANOUS URETHRA

Strictures are seldom limited to this area but extend either distally to the anterior urethra or proximally to the prostatic urethra. On the retrograde urethrogram, the normal truncated shape of the membranous urethra is replaced by a narrow straightened canal with a notched outline. On the voiding urethrogram this area is fixed and fails to distend in a normal manner.

STRICTURES OF THE PROSTATIC URETHRA

Strictures of the prostatic bed (Fig. 6) may be classified into the following types:

A. Sphincteric. — The infracollicular portion of the urethra contains constricting scar tissue which may cause a short circular stricture or may be elongated and extend through the external sphincter to the membranous and, in some cases, the bulbous urethra (Fig. 7).

B. Vesical.—Fibrosis at the vesical neck is not a rare sequela after prostatectomy. Strictures in this area are apt to interfere with the efficiency of the internal sphincter and cause many marked symptoms (Fig. 8).

C. Fusiform.—This is a combination of types *A* and *B* in the same patient (Fig. 9).

D. Scarification.—Fibrosis and stricturing of a major portion of the prostatic urethra have been observed after wide fulguration in persistent infection and following prolonged hemostatic bagging or packing (Fig. 10). On the voiding urethrogram, the base of the bladder does

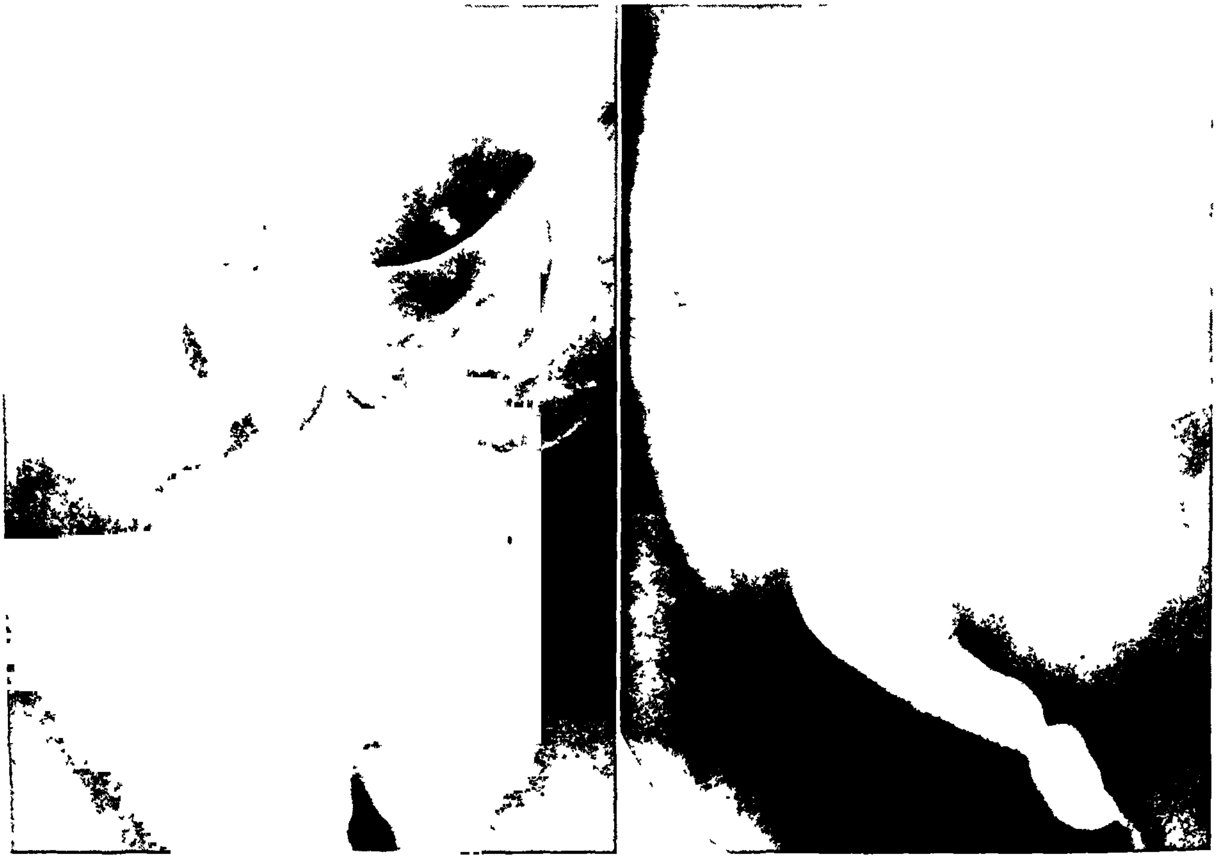


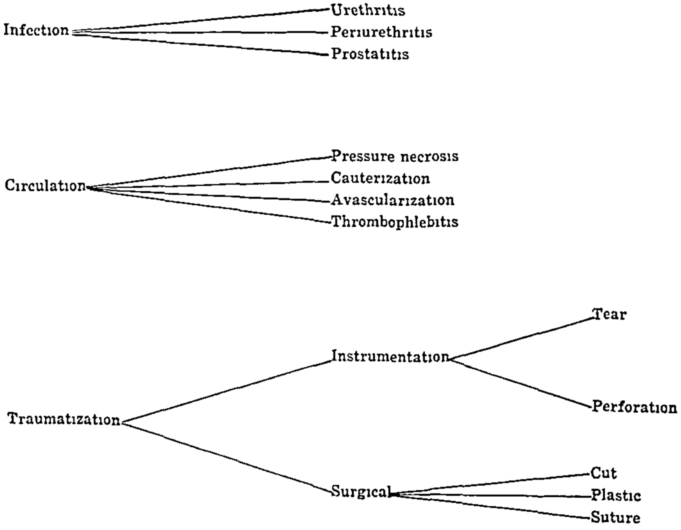
Fig. 2.—Multiple urethral strictures. L. W., aged 79. In April, 1948, the patient had a transurethral prostatectomy performed at a New York clinic. Symptoms of prostatism persisted. Pain also developed in the penis and penoscrotal angle. Note the strictures: (*1*) of the membranous urethra; (*2*) of the penile urethra, and (*3*) in the navicular urethra.

quired Frequent catheterization should be avoided if possible With bleeding from a congested prostate in one patient who developed strictures after operation, there was a history of 6 changings of the urethral catheter because of obstruction by small blood clots prior to surgical intervention The diabetic patient is especially susceptible to urethritis and requires special attention In 1 such patient the infection became so severe that there was actual sloughing of pieces of the urethral mucosa Expert and continuous control of the diabetic situation is advisable for all diabetic patients who undergo prostatectomy

The presence of severe anterior urethritis during convalescence and its persistence after prostatic operations may lead to stricture formation The mucosa becomes edematous, and inflammatory exudates form in the submucosal tissues, which become organized and eventually are replaced by varying amounts of scar tissue The urethral canal loses its distensibility according to the degree of sclerotic infiltration On the urethrogram, a wavy outline and a diminution of the size of the lumen are noted In those patients in whom the process continues the sclerosis results in hard infiltrations, which appear as multiple constrictions

Meatitis may develop from placing too large a catheter in too small a urethral canal This is sometimes done preoperatively, especially if hematuria is present, in an attempt to obtain as large a caliber as possible for drainage of clots There should be sufficient space between the catheter and the urethral mucous mem

CHART 2 —*Postprostatectomic Urethral Strictures (Etiologic Classification)*



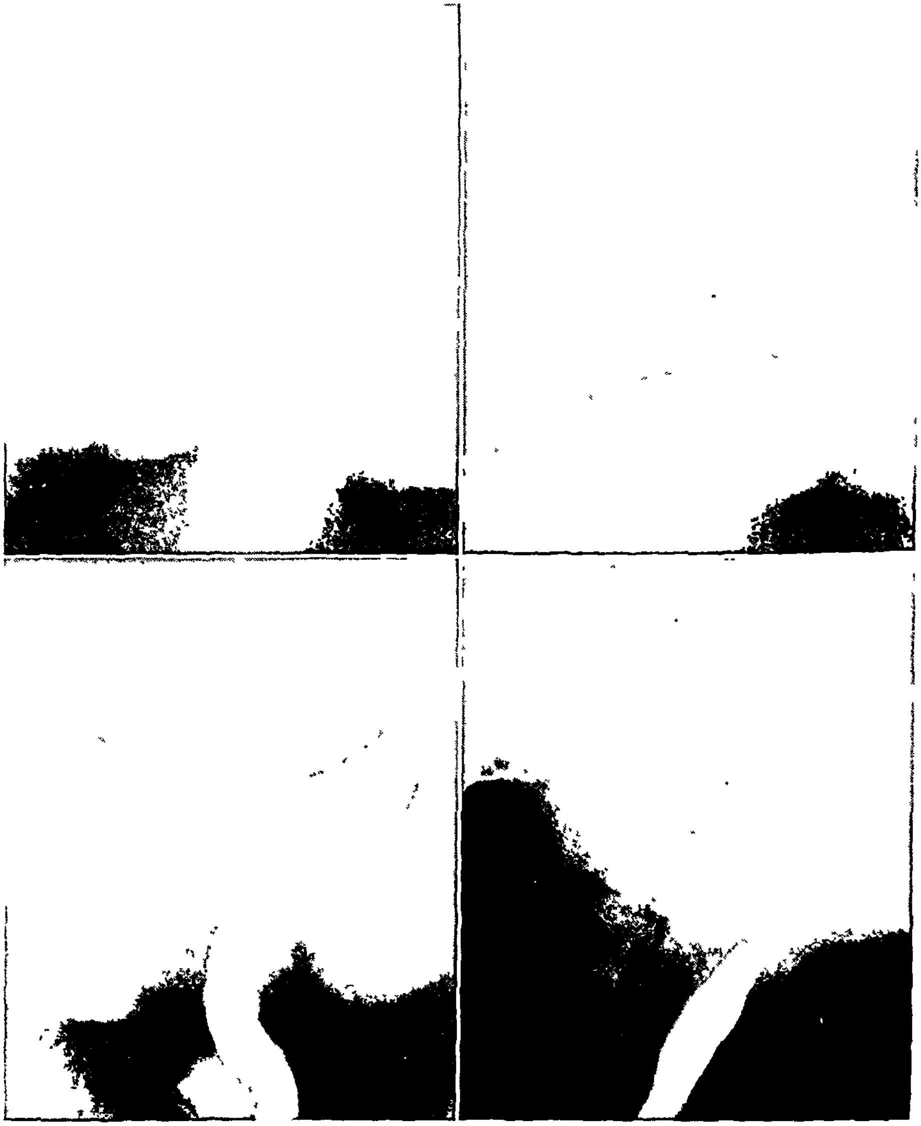


Fig. 4—Extrinsic periurethral stricture. M. N., aged 64. Above, two urethrograms taken March 7, 1946, six months after a suprapubic prostatectomy. Note the urethrovenous reflux and the periurethral extravasation of the opaque medium in the region of the bulbous urethra. Below, urethrograms taken March 17, 1950. Note the strictures now prominent in the bulbous area.

Very often dysfunctions following prostatectomy are not dependent on the degree of technical perfection at the time of operation, the dexterity of the surgeon or even the choice of operation, but are due rather to the neglect of certain surgical principles which were recognized by our urologic predecessors and which today, in spite of the new armamentarium, maintain their importance. Some of these axioms are reactivated and stressed in the following classification.

INFECTION

Urethritis.—The avoidance of urethral drainage prior to prostatectomy is desirable when possible. The occurrence of severe urethritis during the bladder drainage period often results in strictures. Some urethral infections persist in the presence of a catheter in spite of chemotherapy. Suprapubic drainage is preferable to the indwelling urethral catheter when prolonged vesical drainage is required Frequent catheterization should be avoided if possible With bleeding from a congested prostate in one patient who developed strictures after operation, there was a history of 6 changings of the urethral catheter because of obstruction by small blood clots prior to surgical intervention The diabetic patient is especially susceptible to urethritis and requires special attention In 1 such patient the infection became so severe that there was actual sloughing of pieces of the urethral mucosa Expert and continuous control of the diabetic situation is advisable for all diabetic patients who undergo prostatectomy

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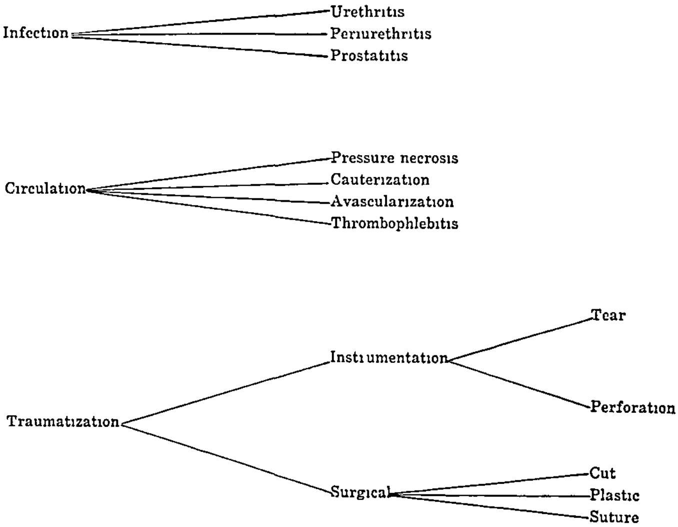

brane to permit drainage of urethral discharge. Constricting adhesive tape is to be avoided. Pressure of the mucosa against the catheter interferes with the circulation, causing necrosis and subsequent scar tissue replacement. This sometimes can involve large areas of the urethra. The diabetic patient is especially susceptible to this condition. The use of plastic catheters may be of some value in preventing urethral infection and irritation and may help to diminish the incidence of this complication. Adequate urethral meatotomy prior to catheterization in a patient with a small meatus will minimize the incidence of this.

Periurethritis. — The urethral glands (glands of Littré) are involved by infection during the course of urethritis. If there is sufficient drainage between the orifice of the gland and the catheter, the infection may be self-limiting. If the orifice of the urethral gland is obstructed and there is no room for drainage, the infection backs up and breaks through the confines of the gland, invades the surrounding tissues, and produces a periurethral abscess.

Prostatitis.—In the ideal case, after prostatectomy, the urine clears and the prostatic bed becomes re-covered with mucosa within a few weeks. Chronic in-

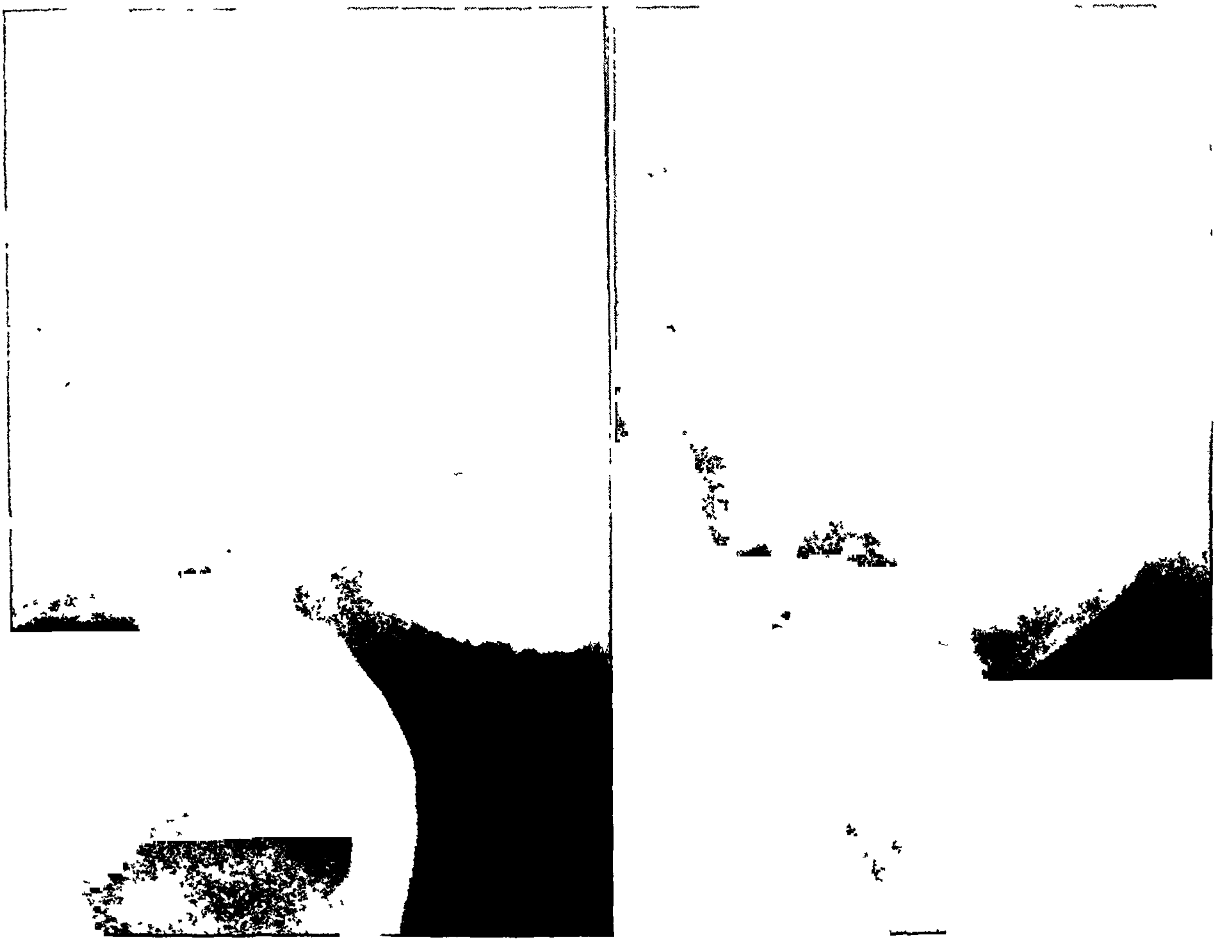

Fig. 5.—Extrinsic perineal stricture. A. P., aged 83, taken in 1942 at a west coast clinic following perineal prostatectomy. The urinary sediment was loaded with pus. Persistent frequency and nocturia occurred every hour. Difficulty arose in passing a No. 16F catheter. A small stone was found in the bladder. The narrowing of the entire membranous urethra is probably due to external scar formation in the perineum. Note that the prostatic urethra has failed to involute and that, although there is an elongated stricture, its walls are relatively smooth.

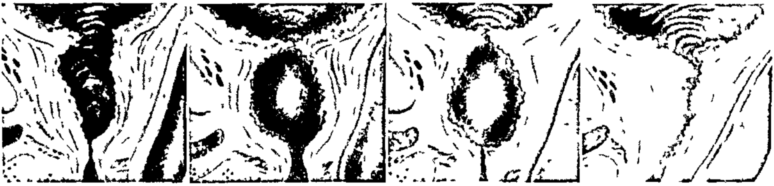

FIG. 6.—Strictures of the prostatic bed. *A*, sphincteric stricture (case of H. R., Fig. 7). *B*, vesical stricture (case of G. L., Fig. 8). *C*, fusiform stricture (case of A. B., Fig. 9). *D*, scarification stricture (case of C. W., Fig. 10).

fection in this area delays the regrowth of the mucosa and increases the amount of fibrous tissue. Incomplete removal of the prostate is a common cause of persistent infection. The adenomatous tissue defies clearing of the infection and leads to a proliferation of the fibrous tissue. The prostatic cavity involutes irregularly and remains distorted by the unequal contraction of the scar tissue. This may interfere with proper closure of the vesical neck and is often the cause of dribbling.

The avoidance of contamination, the institution of adequate drainage in and around catheters and the use of chemotherapeutic agents which are indicated for the specific type of organism will minimize the incidence of strictures due to infection.

CIRCULATION

Pressure Necrosis.—The interference with the blood supply to tissue results in ischemia, death of the cells and their eventual replacement by fibrous tissue. The use of packs, bags and a hemostatic catheter under extreme pressure for extended periods is a common cause of strictures, especially in the region of the membranous urethra.

Cauterization. — Millin[3] recommended the use of the electrocautery to secure hemostasis in the retropubic prostatectomy. Extensive cauterization is undoubtedly a cause of stricture formation. Professor Alfonso de la Peña of Madrid, in a personal communication, mentioned having noted a marked diminution of stricture formation in his retropubic prostatectomies after he stopped using the electrocautery. There is a tendency to overcauterize in transurethral control of hemorrhage from the prostatic bed. Those patients who were treated either for transurethral prostatectomy or by open operation and developed delayed hemorrhage requiring secondary cauterization were likely to develop strictures. Undoubtedly, there is also definite hazard in passing a large resectoscope through a urethra that may still be edematous and infected. Transurethral resections increase the incidence of strictures, as has been noted by many observers. Strictures in the membranous portion of the urethra after transurethral surgical maneuvers follow direct injury by the electric loop, which produces a coagulated surface of devitalized tissue, or indirect injury due to pressure of the resectoscope when the triangular ligament is used as a fulcrum. In 1 patient a narrow inelastic canal developed in an elongated portion of the urethra after an unsatisfactory resection. The sclerosis may have been due to heat in the instrument secondary to a short circuit.

Avascularization.—Avascularization in the prostatic bed is a common cause of stricture formation and is apt to occur after transurethral prostatotomy in which there is incomplete removal of adenomatous tissue and in which large sections may be deprived of their blood supply. Total resection down to the capsule is a difficult operation. Residual prostatic tabs and remnants of devitalized

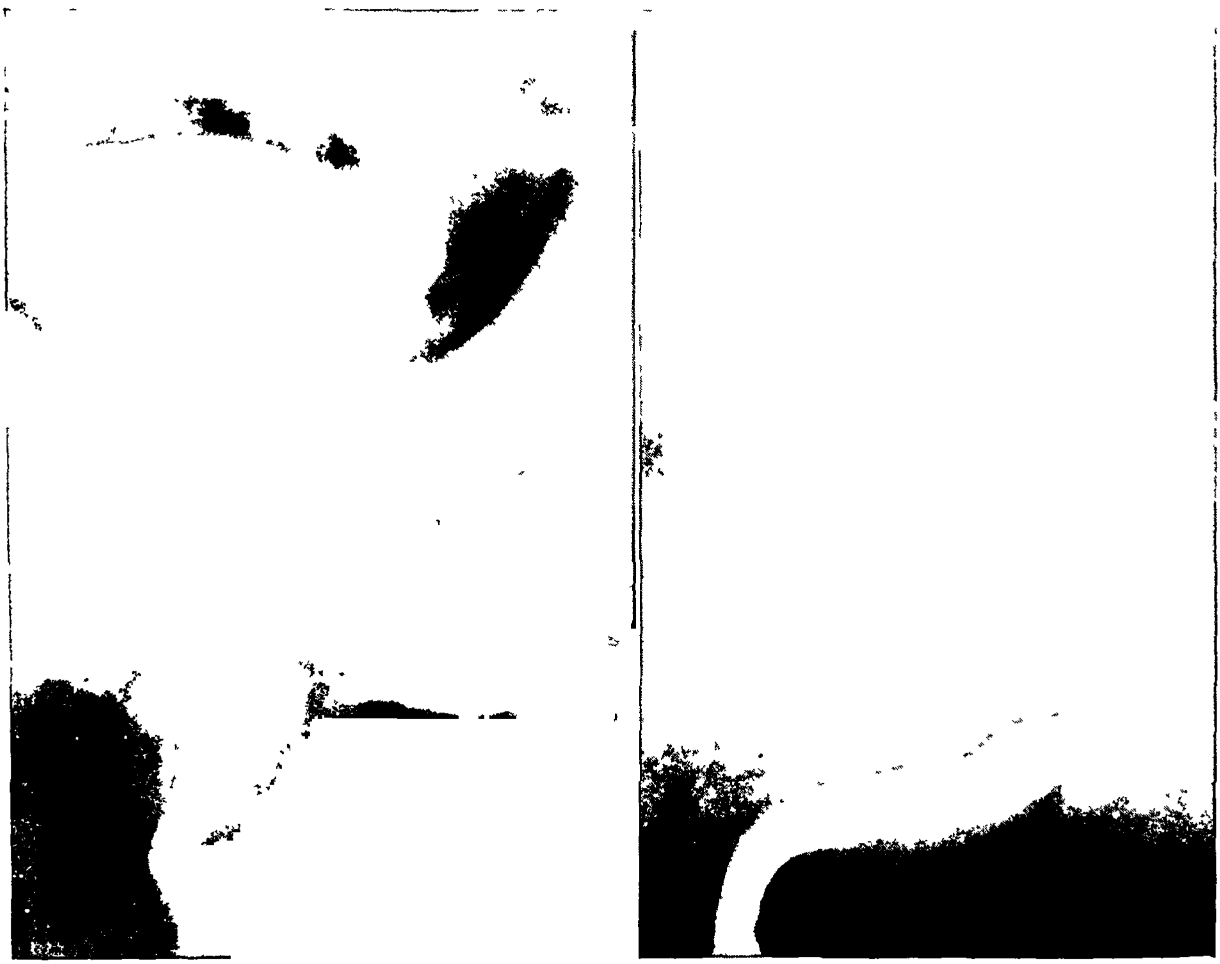

Fig. 7.—Sphincteric stricture of the prostatic bed. H. R., aged 73. On Aug. 30, 1946, a supra-pubic prostatectomy was performed, the removed specimen weighing 19 Gm. On October 17 the patient was examined for dribbling when walking. A urethrogram was taken and the urethra dilated to the caliber of a No. 24F sound. On December 13 the patient voided (q 2-3 hours). There was nocturia (2×), with no dribbling. On Feb. 19, 1948, the patient had difficulty in voiding. The stream was narrow. Pyuria was persistent. The filiform stricture of the membranous urethra was dilated.

tissue act as foci of chronic infection and cause proliferation of fibrous tissue.[6]

Thrombophlebitis.—Strictures often follow trauma to the corpus spongiosum and are due to localized thrombophlebitis or a vascular thrombosis. Organization of a hematoma causes fibrosis and eventual constriction.

TRAUMATIZATION

Stricture secondary to trauma tends to rapid formation of dense cicatricial tissue and constriction early, in contrast to those due to infection.

Instrumentation.—Many patients with prostatism, especially those who develop sudden acute retention, often have their first catheterization done by a physician who is not a urologist. Ability and experience in catheterization varies, and patients are still seen with blood pouring from the urethra after injudicious instrumentation. Undoubtedly, the urethral mucosa and even the deep urethral tissues have been badly traumatized. In these patients, strictures eventually develop which are not related to the actual operative technic. Their origin often puzzles the surgeon.

Even in experienced hands catheterization may be difficult, and protracted efforts will result in urethral trauma. It probably is wise in these cases to resort directly to cystotomy to drain the bladder.

Surgical.—Incision: Strictures of the prostatic urethra in the region of the verumontanum extending to the membranous urethra occur with the suprapubic or retropubic approach if the apex of the gland is improperly divided during enucleation. Sharply cutting across this area rather than risking tearing a portion of the urethral mucosa is advisable.

Plastic Operations on the Vesical Neck: Bitschai and Axler[7] have called attention to the ineffectiveness of plastic procedures in preventing postoperative contractures of the vesical neck. They noted that, despite such technics as the Thompson-Walker posterior V-flap excision, Albarran's incision of the posterior lip of the bladder neck and Harris' posterior stitch technic, contracture may still occur. They expressed the opinion that proliferation of fibrous tissue was secondary to infection of the prostatic bed. Wilhelm and Freed[8] reported 9 cases of stricture of the bladder neck in a series of 33 consecutive retropubic prostatectomies. This complication occurred despite the fact that a V-shaped wedge was excised from the posterior lip of the vesical neck.

Sutures: Sutures were probably the cause of strictures in some of our retropubic prostatectomies. Two or 3 sutures were usually placed into the capsule and tied in position. These sutures must undoubtedly have deprived some of the cap-

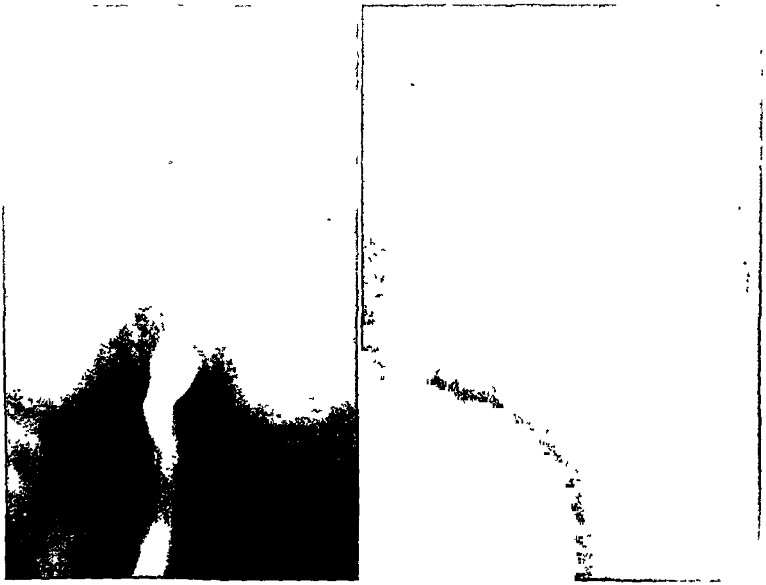

Fig. 8—Vesical stricture of the prostatic bed. G. L., aged 55. Six months after a transurethral resection of a median bar and a slight lobar hypertrophy, there developed a filiform stricture of the vesical neck. The tubular dilated prostatic urethra distal to the stricture is due to overdilatation by the pressure of the opaque medium.

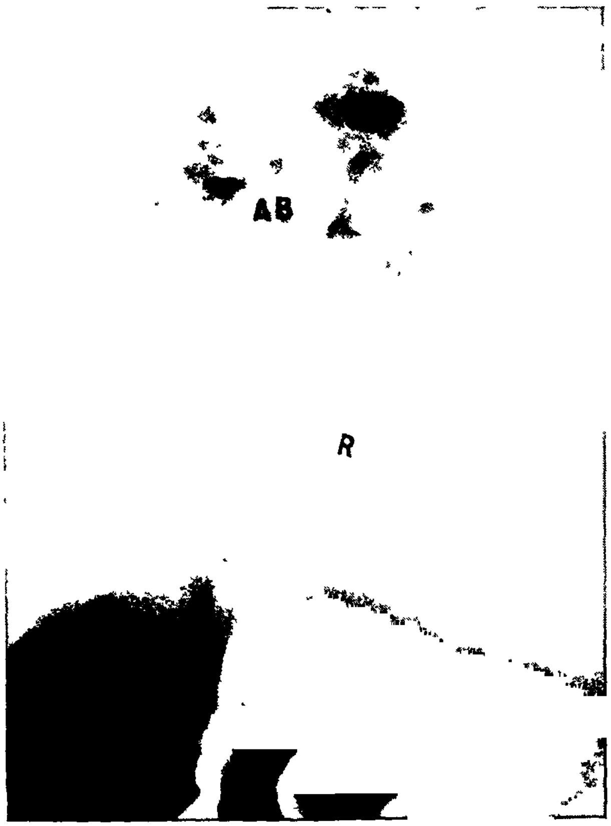

Fig. 9.—Fusiform stricture of the prostatic bed. A. B., aged 63. The patient had difficulty in urinating and voided in small amounts and dribbles. Persistent pyuria existed two and one-half years after a suprapubic prostatectomy. Note the fusiform appearance of the posterior urethra caused by fibrosis of the vesical neck and the stricture of the membranous urethra with a dilated prostatic cavity between.

sule of its circulation. In some instances, the walls of the prostatic cavity were drawn together by mattress sutures. Inside the vesical neck two hemostatic sutures were placed at 5 and 7 o'clock just prior to removing the V-shaped piece from the posterior lip. This also devitalized tissue at the vesical neck.

CONCLUSIONS

1. Urethrographic study is superior to instrumental examination in the demonstration of postoperative strictures.
2. Urethrographic procedures are valuable to record progress after urethral dilatation and to determine the need for further therapy.
3. The prevention of strictures after prostatic operations is possible through the application of rational surgical principles.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Zum Nachweis postoperativer Harnroehrenverengungen ist die roentgenologische Kontrastdarstellung der Harnroehre der instrumentellen Untersuchung ueberlegen.
2. Die Urethrographie ist wertvoll zum Nachweis der Resultate der Harnroehrendilatierung und zur Entscheidung, ob eine Fortsetzung der Behandlung noetig ist.
3. Dem Auftreten von Strikturen nach Prostataoperationen kann durch die Anwendung vernuenftiger chirurgischer Grundsaetze vorgebeugt werden.

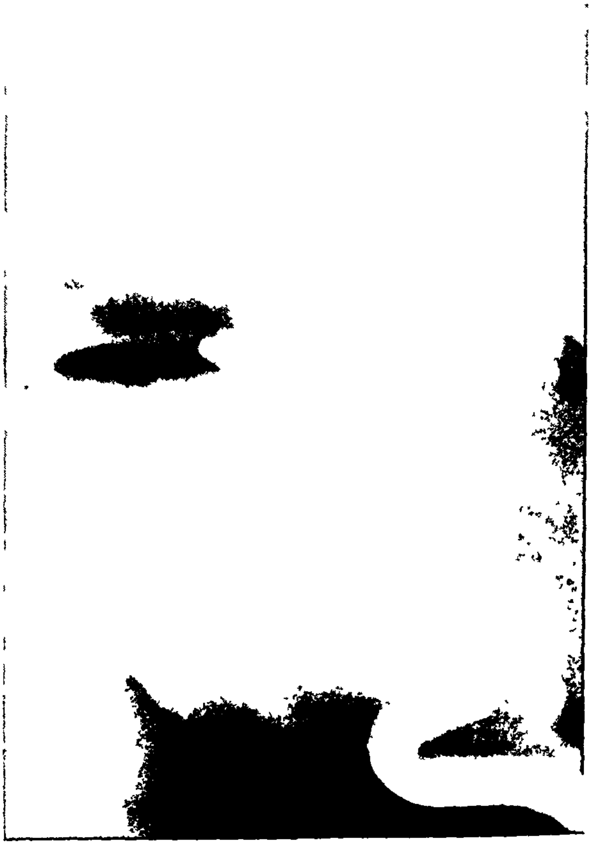

Fig. 10.—Scarification of the prostatic bed. W. B., aged 68. Persistent pyuria and incontinence continued for two years after a suprapubic prostatectomy at another clinic. Note the filiform stricture of a major portion of the prostatic portion of the urethra. Infection and fibrosis were secondary to residual prostatic tissue.

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RESUMEN Y CONCLUSIONES

1 La uretrografia es superior al examen instrumental en la demostracion de estenosis postoperatorias

2 La uretrografia es de valor para registrar progresos despues de dilatacion uretral y determina las necesidades terapeuticas consiguientes

3 La prevencio de estenosis consecutivas a la cirugia prostatica es posible mediante la aplicacion de principios quirurgicos racionales

RIASSUNTO E CONCLUSIONI

1 Uretragrafia e' superiore al esame istrumentale nelle dimostrazioni di stenosi postoperatorio

2 Uretragrafia e' di valore a registrare il progresso dopo dilatazione uretrale e decidere il bisogno di piu terapia

3 L'impedimento di stenosi secondo chirurgia prostatica e' possibile traverso l'applicazione di principii chirurgiche ragionevole

RESUME ET CONCLUSIONS

1 L'urethrographie est preferable a l'examen instrumental pour faire le diagnostic de retrecissements post-operatoires

2 L'urethrographie a une valeur particuliere pour enregistrer l'amelioration apres une dilatation urethrale et determiner la necessite de dilatations ulterieures

3 On peut prevenir les retrecissements post operatoires a l'intervention sur la prostate en suivant rigoureusement les principes de la chirurgie operatoire

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We wish to thank Miss Ericka Carlan John Hopkins Medical School, for the drawings in Figure 6

To Our Contributors Abroad

We regret to announce that under current publishing conditions it has become impossible for the *Journal* to arrange the translation into English of original articles submitted in other languages With the single exception of articles written specifically for the *Seccion en Espanol*, which, of course, do not require translation, we must therefore request that all articles henceforward be submitted in the English language Prompt publication can be greatly facilitated if all manuscripts are typed in double or triple space to allow room for editorial corrections Your cooperation will be deeply appreciated

The Problem of "Bleeding Nipple"

MAX CUTLER, M.D., F.I.C.S.*

CHICAGO

THE purpose of this communication is to discuss the clinical and pathologic factors which govern the treatment of so-called bleeding nipple. The basis of my presentation is a personal series of 3,256 cases observed during the last twenty years.

Few clinical problems present such divergent opinions as the treatment of a breast exhibiting a sanguineous or serosanguineous discharge from the nipple. The indicated procedure is simple enough when a mass is palpable, but in 54 per cent of cases no mass can be felt, and it is this group that constitutes the present dilemma. If one is prepared to accept the view of those who advocate routine mastectomy for bleeding nipple, the problem, of course, disappears. But is one justified in removing the breast of a young woman for a lesion that is almost certainly benign? Actually, the main issue is this: *Under what circumstances is mastectomy advisable, and under what conditions is one justified in adopting more conservative measures?*

Having established that the bleeding is not from the surface of the nipple, one must exclude two conditions before assuming that the underlying cause is a neoplasm. These are vicarious menstruation and hypertension. Both are exceedingly rare and for this reason should be remembered in the differential diagnosis. Bleeding in the breast associated with hypertension has been described as "apoplexy of the breast." Transillumination is of distinct help in making the diagnosis. In cases of vicarious menstruation a careful history elicits the fact that bleeding is usually bilateral and is associated with the menstrual cycle.

With the aforementioned rare exceptions, the lesion underlying the syndrome of "bleeding nipple" is either a duct papilloma or a duct carcinoma. When a tumor is palpable and the clinical signs indicate it to be related to the bleeding, the procedure is clear. The tumor must be excised and examined microscopically, and if carcinoma is present, the radical operation is indicated.

When a tumor cannot be palpated, transillumination often discloses an area of opacity, and pressure over this site causes the escape of blood from the nipple. In these cases the site of the opacity is marked on the skin with the patient lying down, and the area is excised. Microscopic study of the specimen again determines any further procedure.

The difficult problem arises in those cases of bleeding nipple in which no tumor is palpable. The clinical question is, of course, how often does cancer occur in this group? In my experience, this is a rare event. I have seen only 2 examples in 30 cases. In 1 case a carcinoma developed at a considerable distance from the initial lesion, thirteen years after interstitial irradiation. In a second case excision of multiple papillomas around the nipple was followed one year later by carcinoma in another portion of the same breast.

A marked difference of opinion exists upon this question. Those who look upon a duct papilloma as an innocent lesion base their position upon the fact that in certain patients harboring this lesion carcinoma fails to develop after a lapse of some years, even though the lesion is not treated. On the other hand, those who look upon this lesion as a grave menace point to the following evidence:

1. A certain proportion of breasts exhibiting a bloody discharge from the nipple ultimately become affected by carcinoma.

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*Director, Chicago Tumor Institute

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2 The supervention of carcinoma upon the benign process may require thirty or forty years or even longer, so that breasts which have escaped this complication for a relatively few years are by no means immune

3 In the benign papillomatous state in other organs, notably the bladder and the colon, the eventual supervention of vesical carcinoma is frequent and that of carcinoma of the colon almost a certainty

4 Experimental evidence, particularly from experiments with tar, proves the benign papillomatous stage to be one step in the cancer process

Localization—When a tumor is palpable, transillumination helps to localize the lesion and pressure over the mass generally causes the escape of blood from the nipple When a tumor cannot be felt, transillumination usually discloses opacity, and pressure over this site causes the escape of blood Examples in which careful study by transillumination fails to disclose opacity are rare This occurred in only 5 cases among the 30 in which no tumor could be palpated

Treatment—Local excision for duct papilloma is applicable to those lesions situated in the region of the nipple or areola which can be localized by transillumination This conservative procedure is especially indicated when the patient is young, when the chances of carcinoma are at a minimum, and because the patient prefers to avoid or actually refuses removal of the whole breast

The disadvantages of local excision for this lesion are numerous

1 If carcinoma exists, the excision is inadequate This objection is overcome by preparing a frozen section of the removed specimen and carrying out further treatment if carcinoma is present

2 Although transillumination fails to disclose but one lesion, other microscopic lesions may be present and remain outside the field of operation

3 The papillomatous process is sometimes so widespread as to involve the entire duct system of the breast

4 There are considerable technical difficulties in attempting to execute a local excision for duct papilloma, which may prove unsuccessful

Thus local excision is impossible in the group of cases in which the lesion cannot be localized by palpation or transillumination, inadequate in cases of diffuse papillomatosis, and uncertain of removing the entire lesion in cases of apparently localized papillomas Furthermore, it must be promptly followed by more extensive surgical measures if carcinoma is discovered in the excised specimen

Surgeons, therefore, find themselves in a rather unsatisfactory position as regards the surgical treatment of this group of patients The wisdom of performing complete local mastectomy in older women is undisputed But with younger women the question arises, are we justified in recommending the removal of the entire breast in the presence of a serous or serohemorrhagic discharge from the nipple for a lesion which is probably not cancer and which, although potentially cancerous, is not certain to become malignant?

Efforts to treat "bleeding nipple" by external irradiation have not been successful

From every point of view, interstitial irradiation is superior to external irradiation if this form of therapy is to be used at all Theoretical considerations are supported by clinical and pathologic proof that an adequate dose of irradiation administered to papilloma by the interstitial method results in destruction of the lesion and its replacement by fibrous connective tissue without radionecrosis I first presented this idea and reported 2 cases in 1934 At that time I said

"It seems logical to suggest the implantation of removable radium element needles for the treatment of selected patients suffering from a serous or sero hemorrhagic discharge from the nipple The method offers the advantage of avoiding the radical procedure of breast amputation for a lesion which may not be cancer and usually is not cancer when treatment is administered and which possibly may never become cancer It is a more complete procedure than local excision as it treats the entire duct system of the breast and at the same time avoids surgical interference. It should be adequate to destroy completely an early duct carcinoma and especially if it is so early as to fail to be accompanied by a palpable tumor.

"It appears to me to offer an intermediate method between two extremes: the one, over-conservatism, consisting of no treatment, which is dangerous, and the other, complete removal of the breast, which although safe, may be considered radical for small benign lesions."

I have used this method in a total of 20 cases. The discharge in most cases was hemorrhagic; in a few, nonhemorrhagic. In none was there a palpable mass. In all but 5 localization was accomplished by transillumination.

Results.—In 15 cases the discharge disappeared and did not recur. In 1 case, in which the patient was treated thirteen years ago, the discharge ceased completely after four years and has not recurred. In another patient, treated nine years ago, the discharge disappeared only after six years and has not recurred. In 2 cases the discharge continued for one year and local surgical excision of the treated area was performed.

Subsequent operation was performed in 5 of the 20 cases. In 1 case, followed for five years with no recurrence of the discharge,
char teral simple mastecto was
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formed after one year because the discharge failed to stop. Microscopic examination disclosed fibrosis and papillomas.

Of 2 other cases, simple mastectomy was performed in 1 and local excision in the other (elsewhere). In both instances the microscopic diagnosis was fibrosis.

Of 15 cases in which interstitial irradiation was done but not followed by operation, cancer developed in 1 (6 per cent). It is interesting that this incidence of 6 per cent is the same as the incidence of cancer after local surgical excision (Geschickter) and compares favorably with the incidence of cancer in the opposite breast after radical mastectomy for cancer.

The case of the patient in whom cancer developed thirteen years after irradiation is here presented.

REPORT OF CASE

A white married woman aged 41 was first examined on Nov. 27, 1932. She complained of a spontaneous discharge from the left nipple of two months' duration. Her father, an aunt and a sister had died of cancer, but the sites of the cancers were not known. Examination failed to disclose any masses in the breasts. Transillumination demonstrated a faint opacity in the left areola at 9:30, and pressure on this area yielded a clear straw-colored fluid from the left nipple. Microscopic examination of the fluid showed a few red blood cells. A diagnosis of papilloma was made, and on November 29 eleven 2 mg. and five 1 mg. removable radium needles were inserted around the areola. The filtration was 1 mm. of platinum. The needles, totaling 27 mg., were left in place for seventy-two hours. The total dose was 1,944 milligram hours. On December 10 it was noted that the discharge, even on pressure, had subsided completely. It did not reappear. On April 6, 1933, a small, soft subcutaneous mass was first noted in the
eft axilla. On April 25 the mass had not
anged. The patient was not seen again until
uary 1937, at which time there was no
ence of disease or discharge. The patient
given an appointment to return in six
ths but did not report. On May 2, 1945
rteen years after the irradiation) she re-
d to another surgeon, who found a mass
upper portion of the left breast. A
mastectomy was performed by him on

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May 7, and carcinoma was found The patient was living without disease two years later

SUMMARY AND CONCLUSIONS

1 Among 3,256 consecutive cases of pathologic conditions of the breast, there were 211 (6 4 per cent) with a discharge from the nipple, of which 114 (3 5 per cent) showed a hemorrhagic discharge

2 Twenty patients in whom there was no palpable tumor were treated by removable platinum radium needles On 5 *of these, subsequent operation* was performed Of the other 15, cancer developed in 1, thirteen *years later The patient* was well two years after radical mastectomy (fifteen years after irradiation)

3 With the rarest exceptions, bleeding from the nipple is caused by papilloma (65 per cent) and by carcinoma (35 per cent)

4 In approximately one half of the author's cases there was no palpable tumor In this group, the incidence of cancer was 6 per cent

5 Localization of the underlying lesion is possible in about 50 per cent of cases, by palpation, and in about 35 per cent of additional cases, by transillumination

6 In approximately 15 per cent of cases localization is impossible by present methods

7 In approximately 85 per cent of cases in which localization is possible, surgical excision is indicated If carcinoma is present, radical mastectomy is performed, otherwise an effort is made to remove the underlying lesion with as little mutilation as possible

8 When the lesion is diffuse and widespread, mastectomy may have to be performed

9 Since the incidence of cancer is so low in the absence of a palpable tumor, an effort to save the breast should be made in the case of the younger woman, especially in the absence of a clear cut family history of cancer of the breast

10 In the small group (approximately 15 per cent) of breasts in which localization is not possible, occurring in young women with a normal family history, interstitial irradiation should be considered

11 Under special conditions, a combination of surgical excision, to rule out carcinoma, followed by interstitial irradiation *appears to be the only procedure* which is reasonably safe and which, at *the same time, avoids total mastectomy* The conditions referred to apply to very *young women with a normal family his*tory but with lesions too widespread for limited surgical removal, in whom total mastectomy might result in severe psychologic trauma

12 Stimulated by increasing cancer education of the profession and laity, there is developing a dangerous tendency toward radical operation which, on careful reflection, does not appear to be warranted The routine removal of the breast for "bleeding nipple" is an example of this trend The easy theory that removal of all the breast tissues will forever relieve the patient of the danger of cancer of the breast and the surgeon of all responsibility is hardly consistent with sound medical practice It must be assumed as basic that preservation of the breasts for functional, cosmetic and psychosexual reasons is desirable and commendable, provided it can be accomplished with reasonable safety

RESUME ET CONCLUSIONS

1 Parmi les 3,256 cas successifs de lesions pathologiques du sein, il y en a 211 (6 4%) qui presentaient un ecoulement au mammelon, de ce meme nombre, 114 (3 5%) presentaient un ecoulement sanguinolent

2 Les 20 patientes qui ne presentaient aucune masse palpable furent traitees par des aiguilles de radium Cependant, cinq de cellesci durent plus tard subir une intervention chirurgicale Des 15 autres, un cas eut une transformation neoplasique 15 ans apres Cette même patiente etait tres bien deux ans apres l'ablation complete du sein (15 ans apres le traitement d'irradiation)

3 A de tres rares excep
ragie par le mammelon es

un papillome (65%) ouà un néoplasme (35%).

4. La moitié des cas présentés par l'auteur n'avaient aucune masse palpable; dans le groupe, le cancer était de 6% des cas.

5. Par la palpation, on peut localiser dans 50% des cas les lésions sous-jacentes; et dans 35% d'autres cas, par la transillumination.

6. Il est impossible par les procédés actuels de localiser la lésion dans une proportion de 15%.

7. Dans 85% des cas où il est possible de localiser les lésions, l'extirpation chirurgicale, une mastectomie radicale est faite; autrement, on doit s'efforcer d'enlever les lésions sous-jacentes avec le moins de mutilation possible.

8. Si les lésions sont diffuses et étendues, on sera peut-être obligé de pratiquer une mastectomie.

9. Puisque la présence de cancer est si rare quand il n'y a pas de masse palpable, on doit s'efforcer de conserver le sein, surtout s'il s'agit d'une jeune femme, et surtout avec aucun signe clinique défini de cancer.

10. Dans le petit nombre (15% environ) de seins où il est impossible de bien localiser la tumeur, chez des femmes jeunes et présentant un terrain familial normal, il faut songer à l'irradiation des cavités interstielles.

11. A certaines conditions, la combinaison d'extirpation chirurgicale de la masse cancéreuse et d'irradiation interstielle semble être le procédé le plus certain pour éviter la mastectomie totale. Ces conditions s'appliquent aux très jeunes femmes avec une histoire familiale normale, dont la lésion est trop étendue pour permettre une ablation chirurgicale trop restreinte et chez qui la mastectomie totale déclancherait un traumatisme psychologique sérieux.

12. A cause d'une propagande intense, dans la profession médicale et dans le public, on pratique trop souvent une chirurgie mutilante qui ne s'impose pas. On enlève, de routine, tous les mammelons qui saignent. Cette pratique facile d'enlever tous les tissus du sein n'enlève pas à la patiente le danger de cancer ni au chirurgien sa responsabilité professionnelle. On doit prendre pour acquis qu'il faut conserver le sein pour des raisons physiologiques, d'esthétique et psychosexuelles en autant que faire se peut, sans risquer la vie de la patiente.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. In einer Reihe von 3256 aufeinanderfolgenden Faellen von Erkrankungen der Brustdruese befanden sich zweihundertelf (6.4%) mit Absonderungen von der Brustwarze. Hundertvierzehn (3.5%) zeigten blutige Sekretion.

2. Zwanzig Patienten, bei denen keine Geschwulst palpierbar war, wurden mit entfernbaren Platinradiumnadeln behandelt. Fuenf davon wurden anschliessend operiert. Von den uebrigen fuenfzehn Kranken entwickelte eine einen Krebs nach dreizehn Jahren. Diese Kranke zeigte zwei Jahre nach radikaler Brustdruesenresektion (d.h. fuenfzahn Jahre nach der Bestrahlung) keine Krankheitserscheinungen.

3. Blutungen von der Brustwarze werden mit ganz geringen Ausnahmen durch Papillome (65%) und durch Karzinome (35%) hervorgerufen.

4. In etwa 50% der Faelle des Verfassers bestand keine tastbare Geschwulst. In der vorliegenden Serie betrug das Vorkommen von Krebs 6%.

5. Die zugrundeliegende Erkrankung kann in etwa 50% der Faelle durch Palpation und in zusaetzlichen etwa 35% durch Transillumination lokalisiert werden.

6. In etwa 15% der Faelle ist eine Lokalisation mit Hilfe der zur Zeit verfuegbaren Methoden unmoeglich.

7. In etwa 85% der lokalisierbaren Faelle ist die operative Entfernung der Geschwulst angezeigt. Wenn ein Krebs vorliegt, wird eine radikale Amputation der Brustdruese ausgefuehrt; andernfalls wird versucht, die zugrundeliegende Erkrankung unter moeglichst geringer Verstuemmelung zu entfernen.

8. Ist die Erkrankung zerstreut und

weit verbreitet, mag eine Entferung der Brustdruese noetig sein.

9. Da beim Fehlen einer tastbaren Geschwulst das Vorkommen von Krebs so sehr selten ist, sollte bei juengeren Frauen, besonders wenn die Familienanamnese nicht ganz deutliche Hinweise auf Brustkrebs ergibt, ein Versuch, die Brust zu erhalten, gemacht werden.

10. In der kleinen Gruppe von Faellen (etwa 15%) wo bei jungen Frauen mit *normaler Familiengeschichte eine* Lokalisation der Erkrankung unmoeglich ist, sollte die interstitielle Strahlenbehandlung in Betracht gezogen werden.

11. Unter besonderen Bedingungen *erscheint eine Kombination der operativen* Entfernung des Tumors (um einen Krebs auszuschliessen) mit anschliessender interstitieller Bestrahlng das einzige Verfahren zu sein, das einigermassen sicher ist und gleichzeitig eine totale Entfernung der Brustdruese vermeidet. Das bezieht sich auf ganz junge Frauen mit normaler Familienanamnese, bei denen die Erkrankung fuer eine umschriebene Exzision zu ausgedehnt ist, und bei denen andererseits in totale Entferung der Brustdruese ein schweres seelisches Trauma hervorrufen koennte.

12. Die wachsende Aufklaerung der Aertzteschaft und des Publikums auf dem Gebiete der Krebskrankheiten beguenstigt *eine gefaehrliche in der Entwink*lung begriffene Neigung zu Radikaloperationen, die bei sorgfaeltiger Ueberlegung nicht gerechtfertigt zu sein scheinen. Ein Beispiel dieser Tendenz *bildet die routinemaessige Entfernung der* Brustdruese wegen "blutender Warze". Die leichtfertige Theorie, dass die Entfernung der gesamten Brustdruese die Patientin fuer immer der Gefahr des *Brustkrebses und den Chirurgen jeder* weiteren Verantwortung enthebt, laesst sich mit einer vernuenftigen aertztlichen Haltung kaum vereinbaren. Die grundlegende Tatsache, dass die Erhaltung der *Brueste aus funktionellen, kosmetischen* und psychosexuellen Gruenden wuenschenswert und empfehlenswert ist, darf, wenn dieses Ziel mit einen annehmbaren Grade von Sicherheit erreicht werden kann, nicht ausser Acht gelassen werden.

RIASSUNTO

1. Apresso 3,256 casi consecutivi di condizioni patologici della mammella vi erano 211 (6.4%) con secrezione dal capezzola, di quali 114 (3.5%) dimostravano secrezione emorragica.

2. Venti paziente nelle quale non esisteve tumore palpabile furono trattati per aghi ritirabile radio-platino. Su 5 di *queste, operazione susseguente eseguiva.* Degl'altri 15 casi, cancro sviluppo' in 1 tredici anni dopo. La paziente era bene due anni secondo mammectomia radicale (15 anni dopo irradiazione).

3. *Colle piu rare eccezioni, secrezione* sierosoematica dal capezzolo e' causa di papilloma (65%), e di carcinoma (35%).

4. Non esistiva tumore palpabile prossimo meta' dei casi dall'A. in questa gruppo, l'incidenza di cancro era 6%.

5. Localizzazione della lesione e' possibile in circa 50% dei casi per palpazione; ed in circa 35% in oltri casi per transilluminazione.

6. Per approssimazione 15% dei casi, localizzazione e' impossibile presso di metodi presenti.

7. L'estirpazione chirurgica e' indicata in 85% dei casi nelle quale localizazione e' possibile. In caso di carcinoma mammectomia radicale e' ormai fissata; altrimenti unosforza e' fatto a rimuovere la lesione con minima mutilazione.

8. Quando la lesione e' diffusa e larga, mammectomia puo essere eseguita.

9. Poiche' l'incidenza del cancro sia *cosi bassa nell'assenza di tumore palpabile,* uno sforzo a salvare il seno dovrebbe essere considerato in caso d'una donna piu giovane, specialmente nell assenza d'un anamnesi chiaro di famiglia di *cancro della mammella.*

10. Per un gruppo piccolo circa 15% delle mammelle quale localizzazione non sia possibile, in donne giovane con anamnesi normale, irradiazione dovrebbe essere *considerata.*

11. Sotto condizioni straordinari, l'associazione d'estirpazine chirurgica, a negare carcinoma, seguita ad irradiazione sembra ad essere l'unico procedimento che

e ragionevolmente salvo e che, al medesimo tempo evita mammectomia totale. Le condizioni riferiti applicano a donne veri giovanì coll anamnesi normale ma colle lesioni troppe estese per estirpazione limitata, nelle quale mammectomia totale risulterebbe in trauma psicologico severo.

12. Stimulata d'un aumento di educazione sul cancro nella professione ed i laici, vi e' sviluppando una tendenza pericolosa verso operazione radicale che, con biasmo vigilante, non sembra giustificabile. La pratica di rimuovimento del seno per "capezzolo sanguinolento" e un esempio di questo corso. La teoria dolce che rimuovimento di tutti tessuti mammaria sollevera' per sempre il paziente del pericolo di cancro ed il chirurgo di ogni risponsabilita' non conforme alla pratica solida. Bisogna pretendere fondamentalmente che conservazione delle mammelle per ragioni funzionali, cosmetici e psicosessuali sia desirabile e commedabile, purche' si puo effettuare con ragionevole sicurta'.

RESUMEN Y CONCLUSIONES

1. En 3,256 casos consecutivos de estados patológicos mamarios hubieron 211 (6.4%) con salida de líquido del pezón, siendo hemorrágico en 114 (3.5%).

2. Se trataron con rodiumagujas de platino amovibles 20 pacientes sin tumor palpable, habiéndose operado 5 posteriormente. De los 15 restantes, en 1 se desarrolló cáncer 13 años más tarde. El paciente estuvo bien 2 años después de la mastectomía radical, 15 años después de la irradiación.

3. Con muy raras excepciones, lo hemorragia del pezón se debe a papiloma (65%) y a caricoma (35%).

4. En la mitad aproximadamente de los casos del autor no hubo tumor palpable, habiendo sido la incidencia de cáncer en este grupo de 6%.

5. Es posible localizar por palpación la lesión subyacente en el 50% approximadamente de los casos, y por transiluminación el 35% aproximadamente de casos adicionales.

6. Es imposible la localización con los métodos actuales en el 15% aproximadamente de los casos.

7. La extirpación quirúrgica está indicada en el 85% aproximadamente de casos en los que es posible la localización. Mastectomía radical en tratándose de carcinoma. En caso contrario esforzarse por extirpar la lesión subyacente con la mutilación mínima posible.

8. Puede efectuarse mastectomía cuando la lesión es difusa y extensa.

9. Dado que la incidencia de cáncer es tan baja en ausencia de tumor palpable, esforzarse por salvar la mama en caso de mujer muy joven, especialmente en ausencia de antecedentes familiares de cáncer mamario.

10. Deberá considerarse la irradiación intersticial en el pequeño grupo (15% aproximadamente) de mamas en que no es posible la localización, ocurriendo en mujeres jóvenes con antecedentes familiares normales.

11. Bajo condiciones especiales, una combinación de extirpación quirúrgica, para excluir carcinoma, seguida de irradiación intersticial parece ser el único procedimiento razonablemente segura y que, al propio tiempo, evita la mastectomía total. Estas condiciones son para aplicarse en mujeres muy jóvenes, con antecedentes familiares normales pero con lesiones demasiado extensas para extirpación quirúrgica limitada, en quienes la mastectomía total puede resultar un grave trauma psicológico.

12. Estimulada por la creciente educación profesional y pública sobre el cáncer, se está desarrollando una peligrosa tendencia a laoperación radical que, reflexionando cuidadosamente, no parece estar garantizada. La fácil teoría de que la extirpación de todos los tejidos mamarios aliviarán definitivamente al paciente del peligro de cáncer, y al cirujano de toda responsabilidad, es apenas consistente para la práctica médica correcta. Debe afirmarse básicamente que la preservación de las mamas por razones funcionales, cosméticas y psicosexuales es de desearse y recomendarse, con tal de que pueda efectuarse con seguridad.

Ureterovaginal Fistula

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POSTOPERATIVE leakage of urine through the vagina is distressing to *the patient and to the surgeon who* performed the operation Fortunately it rarely occurs, but when it does occur it is usually because of complications that develop during and after operations on the pelvic organs or after difficult labor Each patient presenting this symptom must be carefully examined before the necessary corrective operative procedure can be outlined In the majority of cases the injury that results in lack of control involves the bladder, but sometimes the fistula is due to ureteral injury, either alone or in combination with vesical injury Previous articles have described the management of patients suffering with *vesicovaginal fistula*[1] *In order to clarify* the subject further we have studied the case records of 35 patients for whom a diagnosis of ureterovaginal fistula was made at the Mayo Clinic from Jan 1, 1930, through Dec 31, 1949 Data concerning the etiologic factors, diagnosis and treatment will be reviewed

Etiologic Data—In the majority of our patients ureterovaginal fistula had developed during convalescence from a gynecologic operation At first thought one might falsely conclude that this is a complication only of operations performed by inexperienced surgeons That such is not the case is attested by a review of the discussion which has ensued after presentation of this subject at meetings during the past few decades Admitted leaders in the field have thus informally reported cases Fortunately, however, it is a rare complication, occurring, according to several authors, in approximately 0 4 per cent of hysterectomies This figure, cited by Sampson[2] and by Newell,[3] seems high

*In 3 of the 35 cases observed by our*selves we have seen incontinence that developed after a difficult forceps delivery of an abnormally large infant The patients in these cases all suffered from both vesicovaginal and ureterovaginal fistula In each instance, in addition to the vesical injury, the left ureter was injured In 3 other cases a combination of vesicovaginal and ureterovaginal fistula was present when the patient was first examined at the clinic In 30 cases hysterectomy was the surgical procedure which led to the development of the ureterovaginal fistula Twenty-three of these were abdominal hysterectomies, in 7 instances a vaginal type of removal was done In 1 case posterior colpotomy had been performed in order to drain a pelvic abscess, and there is some reason to think that the ureterovaginal fistula formed as a result of erosion of the ureter rather than of surgical trauma In 1 case the operation said to have been performed was abdominal suspension of the uterus and tubal ligation In 6 of the 30 cases in which hysterectomy was performed the uterus was removed because of malignant disease In 2 of these a Wertheim type of operation was performed In such a procedure the risk of ureteral injury is no doubt greater than it is in the ordinary type of hysterectomy However, in this operation the surgeon is usually very careful to isolate the ureters and thereby avoid clamping, ligating, cutting or otherwise injuring them

According to the history given by the patient and by the surgeon who referred her to the clinic, the injury in practically every case was not recognized until several days to several weeks had elapsed after the operation In some cases many months passed before the diagnosis of ureteral in [illegible] was established, mean-

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while the vaginal leakage was blamed on a weak bladder or urethral sphincter.

Every surgeon is justly conscious of the possibility of injury to the ureters; nevertheless, if the injury occurs it is nearly always at some stage of the operation when it is least expected. It is mandatory to avoid the ureters carefully at all times, especially when performing an unusually difficult operation, such as removal of large fibroids extending into the broad ligaments or of inflammatory adnexae, endometrial cysts or pseudomucinous cysts which are stuck tightly in the pelvis. The use of ureteral catheters as a guide, placed preoperatively, has been advocated, but most gynecologic surgeons believe this precaution to be unnecessary and some say that it is not much help even if done. We believe that the preoperative placing of ureteral catheters in an extremely difficult procedure, such as a radical Wertheim operation, might be justified.

Moore's recent article[4] discusses methods of repair that have been employed when ureteral injury is recognized at the time of operation. The history given in our cases indicates that injury is seldom recognized until much later, during convalescence.

Perhaps one common cause of ureterovaginal fistula is lack of proper care during reperitonealization of the pelvis, when a stitch can be passed through the ureteral wall or around the ureter, resulting in pressure necrosis and sloughing later, secondary to edema and inflammation. The ureter is not difficult to recognize when it lies in its normal course. Its contraction can be elicited as an aid in identification by gently pinching the ureter with a thumb forceps. However, in some instances the ureter is pushed from its normal course by large cystic or solid growths and is greatly lengthened and thinned, in which case it may easily be overlooked during the hurry of operation and thus unwittingly be clamped, severed and ligated. It has been stated that many ureters are thus injured and the damage not recognized because it is unilateral, the kidney on that side going on to atrophy without clinical recognition. We doubt that this is true, but our impression has not been verified by making routine postoperative excretory urograms in a large series of cases.

Diagnosis. — Suspicion of ureteral injury is usually entertained because of pain in the flank and sometimes high fever and elevation of the pulse rate soon after operation. When it is evident that urine is leaking through the vagina postoperatively, one thinks first of vesical injury, because it is more common than ureteral injury. One must, however, keep in mind that injury to the ureter may occur simultaneously. Several of the patients we examined presented such a combined lesion. Hence, it is very important to study each patient carefully before drawing definite conclusions and outlining therapy. If both ureters have been injured the fact is usually recognized soon after operation, because of failure of urinary excretion. In such cases there is no leakage from the vagina, and catheterization of the bladder will find it empty. However, in exceptional cases bilateral injury may occur, in which one ureter is completely occluded temporarily and the other only partially obstructed by a stitch through only a portion of it. In this case urine will be found in the bladder and, later, drainage into the vagina will occur first from one ureter and subsequently from the other. In such cases accurate diagnosis is usually somewhat delayed.

When leakage is due to injury of the bladder, total incontinence develops soon after operation and the patient is unable to void. However, it must be kept in mind that, as has been stated, total incontinence does not exclude the possibility of ureteral injury. Careful study, however, will establish the source of the urine in every case. Nevertheless it is sometimes difficult to prove the point, particularly if the vesicovaginal fistula is very small. If water colored with indigo carmine is placed in the bladder and it appears promptly in the vagina the diagnosis of vesicovaginal fistula is practically certain. The only case in our series in which this was misleading was one in which the dye, by reflux up a dilated ureteral orifice, found its way into the vagina through a ureteral fistula. If indigo fails to appear in the vagina but a vaginal pack becomes soaked with urine it is certain that one is dealing with ureterovaginal fistula. Further proof of its existence can be obtained by studying the puckered area which is found usually high in the vaginal vault, to one side of the midline. Spurts of urine will sometimes be observed, especially if the ureter is still relatively normal in caliber and has good tone. If the ureter is dilated (as determined by an excretory urogram) urine will exude slowly. Sometimes a ureteral catheter can be passed into the sinus, and rarely it will go as far as the renal pelvis. In 2 of our cases, instead of going up to the kidney the catheter passed back down the lower segment of the ureter and entered the bladder through the ureteral orifice. In 1 case the ureter apparently was caught in the line of sutures over the stump of the cervix, because the urine drained into the vagina through the cervix.

Distortion and edema sometimes make cystoscopic study within the first two or three weeks after pelvic operations unsatisfactory, especially after vaginal hysterectomy. Identification of the ureteral orifices may be difficult. It is important to observe the orifices to note whether urine is spurting from them. The intravenous injection of indigo carmine is a great aid, because the normal ureter will spurt forcefully, whereas as a rule there will be no spurt of urine from the meatus of the ureter which is draining into the vagina. However, if only a small opening exists in a segment of the ureter, dribbling spurts of indigo-stained urine may come from the meatus.

Obstruction to the passage of a ureteral catheter will be observed in the majority of cases in the ureter involved in the fistula, but not always. We have noted several cases in which the catheter could be easily passed to the renal pelvis. Apparently, in such cases, the stitch that caused the fistula included only a small portion of the ureteral wall and the subsequent sloughing of this portion established the fistula.

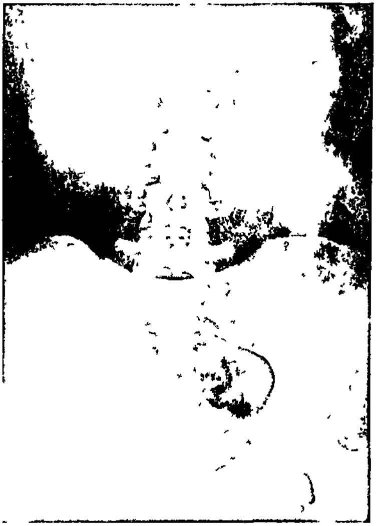

Fig. 1.—Pyeloureterectasis on the left side. After the fistula had formed, an attempt had been made elsewhere to ligate the injured ureter through a vaginal incision.

The excretory urogram is a great aid in diagnosis. In most instances dilatation of the ureter and the renal pelvis and calyces will develop above the point of the fistula. If only one ureter is involved this dilatation will be in great contrast to the normal ureter and kidney on the other side (Fig. 1). But dilatation does not always occur, and in some cases in which practically complete obstruction exists there will be no visualization of the kidney whatever. In our series of cases preoperative excretory urograms were made in 34 cases. In 8 of them there was no pyeloureterectasis apparent, which is contrary to the general belief that a ureterovaginal fistula always results in obstruction and therefore dilatation of the ureter and the renal pelvis. In 1 case the fistula had existed for five years, and yet the urogram revealed the contour of the kidney and ureter to be entirely normal. However, in 21 cases varying degrees of pyeloureterectasis were noted in the urogram, and in 5 cases the kidney was nonfunctioning as far as the excretory urogram indicated. Nevertheless, in these cases sufficient urine was draining from the vagina to require the patient to wear a pad constantly.

It was possible to make retrograde pyelograms preoperatively on the involved side by passing a ureteral catheter through the vaginal sinus (Fig. 2) in only 5 cases. This indicates how helpful the excretory urogram has proved to be in the diagnosis of ureterovaginal fistula.

Treatment.—Hinman[5] has stated that in 50 per cent of cases ureterovaginal fistula will heal without surgical intervention. This opinion does not coincide with our own experience. The use of inlying ureteral catheters, if it is possible to pass them easily, thus indicating the presence of continuity of most of the ureteral wall at the point of injury, seems justified, particularly since in recent years the newer antibiotics are so useful in reducing the chance of renal infection to a minimum. In 1 of our cases, in which the patient was a physician's wife, repeated cystoscopic procedures over a period of two and a half years failed to close a fistula which was interpreted to be due to a slight nick in the ureteral wall very close to the intramural portion. Thirty-three cystoscopic procedures were done, including dilatation, fulguration, applications of solutions of silver nitrate, etc., without permanent benefit. Finally reimplantation of the ureter into the bladder was done, but three months later an excretory urogram revealed nonfunction of the kidney. Therefore, it would seem that unless conservative measures succeed early in the course of treatment one should resort to operation without undue delay.

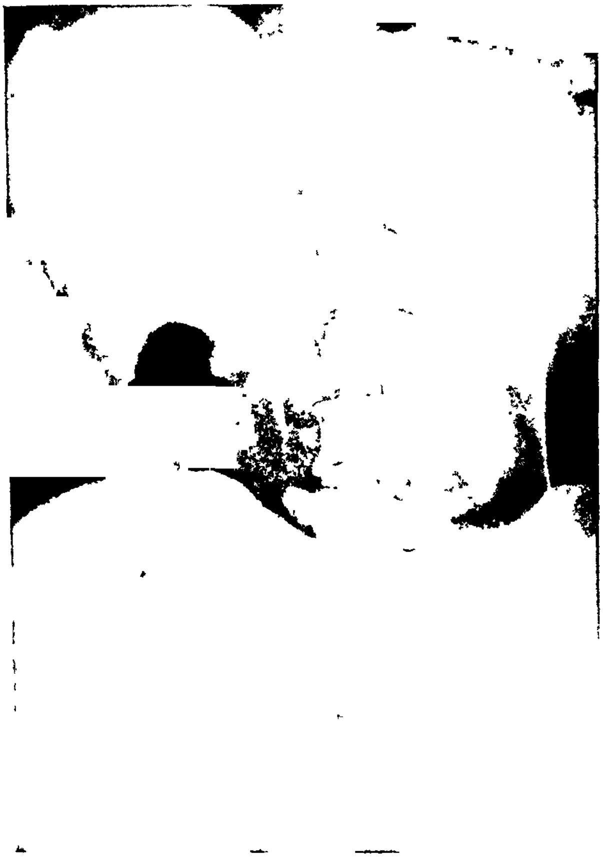

Fig. 2.—Retrograde urogram made by injecting catheter passed into the vaginal sinus. Note medium which has collected in vagina.

Several things must be considered before deciding on the surgical procedure to be employed for the correction of ureterovaginal fistula. If the patient has suffered from repeated attacks of fever and chills and the excretory urogram reveals a nonfunctioning kidney or advanced pyeloureterectasis it is probably best to perform nephrectomy, but of course this operation can be done only if the opposite kidney is normal. It is certain that nephrectomy is the simplest operation, and often these patients are worn out and badly discouraged by previous attempts to correct the leakage. Nephrectomy, therefore, was employed in 20 of our cases. Examination of the removed kidney showed multiple cortical abscesses in most instances. In only 2 cases was the kidney somewhat atrophic; in all others it was larger than normal, in some instances four or five times the normal size. No attempt was made to remove all of the ureter, even though it was dilated; however, as much as could be conveniently removed through the usual lumbar incision was extirpated along with the kidney.

Reimplantation of the ureter into the bladder is theoretically the ideal operation, especially if fever and chills due to renal infection have not complicated the course and if the excretory urogram shows good function and little or no pyeloureterectasis. The point of injury to the ureter also helps one decide on the procedure. If it is only a few centimeters above the ureteral meatus or juncture with the bladder reimplantation can be easily done (Figs. 3 and 4); but if the injury is 8 to 10 cm. above the vesical wall it is unlikely that the ureter can be mobilized sufficiently well to permit reimplantation without tension. If an operation is done with the anastomosis under tension it will usually fail, resulting in renal atrophy. Operations have been described involving the use of a sleeve of vesical wall which is brought up to meet the shortened ureter. We have not used this procedure. In our cases the ureter was reimplanted into the bladder a few centimeters above the normal site, the ureter being brought through diagonally and the vesical wall being stitched over a small portion of the termination. Flaps of split ureter were not sewed within the vesical wall; rather, the end of the ureter was allowed to protrude 1 or 2 cm. into the vesical cavity as is done in ureterointestinal anastomosis. In 4 cases a splinting catheter was employed. In a total of 11 cases in this series reimplantation of the ureter into the bladder was performed.

In 2 of our cases, because of extensive destruction of the bladder by operations done prior to the patient's coming to the clinic, it was found necessary to utilize ureterointestinal anastomosis. In 1 of these cases bilateral transplantation was done and in the other case unilateral transplantation, the opposite kidney having long since stopped functioning because of ureteral occlusion.

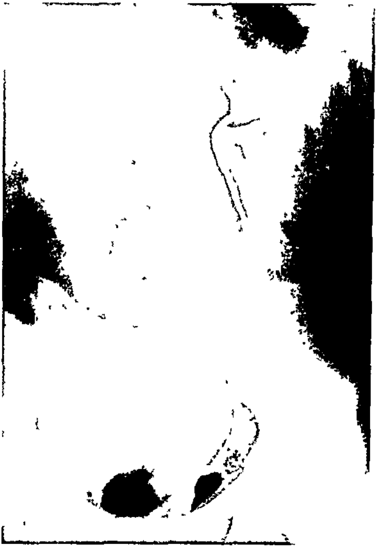

Fig. 3.—Preoperative excretory urogram showing ureterectasis and fistula draining into the vagina.

In 1 of our patients with bilateral ureteral injury a combination of nephrectomy (for a badly infected kidney) and cutaneous ureterostomy was employed. For this patient cutaneous ureterostomy was chosen because she was severely ill and a large segment of ureter had sloughed away after a Wertheim hysterectomy for carcinoma of the uterus.

The success of reimplantation into the bladder should be greatly enhanced by the new antibiotics. Not only should these patients be seen when the kidney and ureter are in better condition because of avoidance of prolonged infection, but the use of such drugs during postoperative convalescence will improve the healing processes.

Results of Treatment.—There were no deaths from treatment. Those patients who underwent nephrectomy recovered without incide[illegible]d [illegible]ir fistulas of

Fig. 4.—Urogram made six months after reimplantation of the ureter into the bladder, showing normal calyces and pelvis and absence of ureteral dilatation.

course promptly stopped draining immediately after operation.

Of principal interest is the result of reimplantation of the ureter into the bladder. In only 2 of the 11 cases in our series in which this procedure was employed has trouble with the kidney developed subsequently. In both instances renal atrophy occurred, and in 1 of these hypertension developed, whereas in the other the patient continued to have a normal blood pressure. In the other 9 cases the result of reimplantation was apparently excellent, for there were no symptoms and in 6 of them urograms made subsequently were interpreted as normal. Reimplantation into the bladder was done in 1 of our cases in spite of marked ureterectasis and apparently with an excellent result, for the leakage was corrected and the patient remained well until she was lost sight of more than a year after operation.

The patient who underwent cutaneous ureterostomy remained well for several years but finally had difficulty with the stoma, and her physician at home resorted to permanent nephrostomy, which continued to serve well for years.

The 2 patients for whom ureterointestinal anastomosis was done have both remained well from a clinical standpoint, but excretory urograms have disclosed moderate pyeloureterectasis. The Coffey-Mayo type of anastomosis was used in these cases. As has been stated, it was done only as a last resort because of extensive destruction of the bladder resulting from several operations performed earlier which had failed to correct leakage.

SUMMARY AND CONCLUSIONS

1. Thirty-five cases of ureterovaginal fistula were studied and significant data concerning them are presented. In 32 cases the history indicated that ureteral injury resulting in the formation of fistula had occurred during the course of operation on the pelvic organs. In 3 cases the injury resulted from forceps delivery of an abnormally large baby.

2. In addition to the ureteral injury, 6 of the 35 patients suffered from vesicovaginal fistula. In 2 cases both ureters were injured, and in 33 the injury was unilateral at the time of admission for treatment.

3. Cystoscopic examination and ureteral catheterization, excretory urographic study, vaginal examination with catheterization of the fistula if possible and sometimes retrograde urographic study are necessary to determine the point of injury and to establish the normality of the opposite kidney and ureter.

4. The operation most frequently employed to correct ureterovaginal fistula is nephrectomy (20 of our own cases). Reimplantation of the ureter into the bladder was employed in 11 cases and ureterointestinal anastomosis in 2 cases. In 1 case cutaneous ureterostomy was done after the opposite kidney had been removed (in a patient with bilateral fistu-

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las). Two patients of the 35 refused operative treatment.

5. From a clinical standpoint the best results are obtained from nephrectomy; these patients get along very well if the remaining kidney is sound. Reimplantation of the ureter into the bladder should be done if the ureter is comparatively normal and there has not been a history of recurring fever and chills. Ureterointestinal anastomosis should be resorted to only when the bladder cannot be made useful.

6. In this series of 35 personally observed cases, in 33 of which surgical treatment was used, there were no deaths.

RESUME AVEC CONCLUSIONS

1. Nous avons étudié 35 cas de fistule urétéro-vaginale avec leurs détails. 32 de ces cas devaient leur fistule urétérale à des manipulations chirurgicales d'origine pelvienne. 3 cas à la suite d'accouchements laborieux où l'on s'était servi de forceps.

2. En plus de leur fistule urétérale, 6 cas sur les 35 présentaient une fistule vésico-vaginale. Les 2 uretères étaient lésés dans les deux cas; les 33 autres, lors de leur admission, ne présentaient qu'une lésion unilatérale.

3. Pour déterminer le site de la lésion, et connaitre la valeur de l'uretère et du rein du côté opposé, il faut pratiquer une cystoscopie, un cathétérisme des uretères, une pyélographie endoveineuse, un examen du vagin avec exploration de la fistule; quelquefois même une pyélographie rétrograde.

4. Dans 20 de nos cas, la néphrectomie a dû être faite pour tarir la fistule. Onze autres cas ont eu la réimplantation vésicale de l'uretère, tandis que deux cas subirent l'urétéro-sigmoidostomie. Chez un patient présentant une fistule bilatérale, on a dû néphrectomiser un côté et pratiquer une urétérostomie cutanée de l'autre. Des 35 patients, deux seulement refusent l'intervention chirurgicale.

5. Au point de vue clinique, le meilleur résultat a été obtenu par la néphrectomie, à condition que l'autre rein soit suffisant. Pour pratiquer la réimplantation de l'uretère dans la vessie, il faut que l'uretère soit plutôt normal et qu'il n'y ait pas eu de frisson urinaire ou de fièvres urinaires. La réimplantation intestinale sera réservée aux seuls cas où la vessie ne peut plus servir.

6. Parmi cette série de 35 cas, il y eut 33 cas opérés sans mortalité aucune.

RESUMEN Y CONCLUSIONES

1. Se estudian 35 casos de fístula ureterovaginal y se presentan datos significativos referentes a los mismos. En 32 casos la historia reveló que la lesión ureteral, origen de la fístula, ocurrió durante la operación de órganos pélvicos. En 3 casos la lesión resultó de la aplicació de fórceps por parto con feto anormalmente grande.

2. Además de la lesión ureteral, 6 de las 35 pacientes sufrieron de fístula vésicovaginal. En 2 casos fueron lesionados ambos uréteres y en 33 la lesión era *unilateral a su admisión para tratamiento.*

3. Cistoscopia y cateterización uretral, urografía excretoria, examen vaginal con cateterización de la fístula si es posible y algunas veces urografía retrógada, son necesarios para determinar el sitio de la lesión y restablecer la normalidad del riñón y uréter contralaterales.

4. La nefrectomía es la operación más frecuentemente empleada en fístula ureterovaginal (20 casos del autor). En 11 casos se hizo la reimplantación del uréter en la vejiga y en 2 casos anastomosis ureterointestinal. En 1 caso se efectuó ureterostomía cutánea después de extirpar el riñón contralateral, en un paciente con fístulas bilaterales. No aceptaron el tratamiento operatorio 2 de los 35 pacientes.

5. Desde un punto de vista clínico se obtuvieron los mejores resultados con la nefrectomía, continuando los pacientes muy bien de encontrarse sano el riñón remanente. La reimplantación del uréter en la vejigo debe hacerse si el uréter es comparativamente normal y no ha habido historia de fiebre y escalofríos recurrentes. Debe recurrirse a la anas[illegible]osis [illegible]ero-

intestinal solamente cuando la vejiga no puede utilizarse.

6. No hubo ninguna muerte en los 33 casos operados de esta serie personal de 35 casos.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Es wird eine Reihe von fuenfunddreissig Faellen von Harnleiterscheidenfisteln untersucht und ein Bericht ueber die wesentlichen Befunde vorgelegt. In zweiunddreissig Faellen ergab die Krankheitsgeschichte, dass die zur Fistelbildung fuehrende Verletzung waehrend eines chirurgischen Eingiffs an den Beckenorganen erfolgte. In drei Faellen war die Verletzung das Result at der Zangengeburt eines uebernormal grossen Kindes.

2. Sechs von den fuenfunddreissig Kranken trugen ausser der Harnleiterverletzung noch eine Blasenfistel davon. In zwei Faellen waren beide Harnleiter verletzt, und in dreiunddreissig handelte es sich zur Zeit der Aufnahme zur Behandlung um eine einseitige Verletzung.

3. Um den Sitz der Verletzung zu bestimmen und die Unversehrtheit der anderen Niere und des anderen Harnleiters zu sichern, sind Blasenspiegelungen, Harnleiterkatheterisierungen, intravenoese Roentgendarstellung der Harnorgane, wenn moeglich vaginale Untersuchung mit Katheterisierung der Fistel und manchmal retrograde Roentgenuntersuchung der Harnorgane notwendig.

4. Die zur Beseitigung einer Harnleiterscheidenfistel am haeufigsten angewandte Operation ist die Nierenresektion, die in zwanzig unserer eigenen Faelle ausgefuehrt wurde. Die Wiedereinpflanzung des Harnleiters in die Blase wurde in elf und eine Ana stomose zwischen Harnleiter und Darm in zwei Faellen vorgenommen. In einem Falle wurde eine Ureterostomie durch die Haut nach aussen vorgenommen, nachdem die andere Niere entfernt worden war (es handelte sich um einen Kranken mit doppelseitiger Fistel). Zwei von den fuenfunddreissig Kranken lehnten eine chirurgische Behandlung ab.

5. Vom klinischen Standpunkt aus ergibt die Nierenresektion die besten Resultate; diese Kranken nehmen einen guenstigen Verlauf, wenn die verbleibende Niere gesund ist. Die Wiedeeinpflanzung des Harnleiters in die Blase sollte ausgefuehrt werden, wenn der Harnleiter verhaeltnismaessig normal ist, und wenn die Krankheitsgeschichte nicht wiederholtes Fieber und Schuettelfroeste aufweist. Das Anlegen von Harnleiterdarmanastomosen sollte nur dann ausgefuehrt werden, wenn die Harnblase nicht nutzbar gemacht werden kann.

6. Todesfaelle sind in dieser Serie von fuenfunddreissig Eigenbeobachtungen, von denen dreiunddreissig chirurgisch behandelte Faelle waren, nicht vorgekommen.

RIASSUNTO E CONCLUSIONI

1. Trentacinque casi di fistole ureterevaginali furono studiati e presentano tema significante sopra di questi. In 32 casi l'anamnesi indicava che il danno ureterale risultando nella formazione della fistola si presento' durante la condotta dell 'operazione sugl'organi pelvici. In 3 casi l'ingiuria risultava d'un parto a forcipe d'un bambino di grossezza anormale.

2. In aumento al danno ureterale, 6 dei 35 pazienti subirono fistola vescicovaginale. In 2 casi ambedue ureteri furono ferite, ed in 33 il danno fu unilaterale all 'ora d'entrata per trattamento.

3. L'esame cistoscopico ed il cateterismo dell 'uretere, studio urografico escretorio, esame vaginale con caterterismo della fistola se possibile e qualche volte studio urografico retrogrado sono necessario a determinare la punta d'ingiuria e stabilire la normalita' del rene e dell' uretere dirimpetto.

4. L'operazione piu frequentemente impiegata a correggere fistola ureterovaginale e' nefrectomia (20 dei nostri casi). Ripiantare l'uretere nella vescica risultava in 11 casi e anastomosi ureterointestinale in 2 casi. In 1 caso ureterostomia cutaneo fu fatto dopoche' il

rene opposto era stato rimosso (nel paziente con fistole bilaterali) Due pazienti dei 35 rifiutarono trattamento operativo

5 Dal punto di vista clinica i migliori risultati si ottengano da nefrectomia, questi pazienti vanno molto bene se il rene rimanente sia sano Si dovrebbe ripiantare l'uretere nella vescica se l'uretere e' comparativamente normale e non vi e'stato anamnesi di febbre e brivido ricorrente Anastomosi ureterointestinale sarebbe ricorso soltanto quando non si puo' servirsi della vescica

6 In questa serie di 35 casi osservati personalmente, in 33 di quale trattamento chirurgico fu impiegato, non vi furono morti

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The Relation of Cellular Oxidation to Cancer

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SANTA MONICA, CALIF.

OXIDATIVE disturbances, mechanical, pathologic or physiologic, affecting localized cellular structures in epithelial tissues and organs have a tendency to encourage the reversion of individual cells to their fetal form and the development of malignant characteristics as the result of the action of some carcinogenic agent, either endogenous or exogenous.

This paper is the result of a gradually developing clinical impression. Reports of the most recent technical work have been investigated for confirmation or refutation of the concept. Nothing I have been able to find in this technical material or in authoritative texts has lessened my conviction that this principle is sound, and, though it may be entertained by many in an undeveloped form, I feel that, because of its implications and its practical application to the prevention of morbid processes and the treatment of nonmalignant processes, it will bear considered attention and elaboration. It stands to reason that technical research workers cannot be expected to recognize every facet of clinical application of their discoveries. Herewith is accumulated evidence pointing to the idea that some deviation from normal cellular physiologic structure must have occurred before carcinogenic factors can find any real hospitality in the body tissues.

Anderson has said "It is rare that cancer appears in normal tissue."[1]

The earliest cellular division in fetal growth occurs under conditions of uncertain oxygen supply, and even after the development of the placenta the oxygenated blood from the placenta is mixed with venous blood before being distributed to the fetal tissues. Then a smaller percentage of the oxygen is removed from the blood by the tissues than in postnatal life, and this situation exists when growth and differentiation are taking place at a tremendous rate.

In surveying the principles of cellular respiration as now understood, one finds that in unicellular organisms the acquisition of oxygen and the discharge of carbon dioxide are conceived to occur by simple to-and-fro diffusion through the membranes. As the complexity of animal bodies increases, more and more elaborate means for the support of the cellular respiration must be provided. These are known. In this study, however, I am concerned entirely with unit-cellular respiration in complex animal organisms and its relation to the development of cancer.

The nice relative balance between the red blood cell count and the (barometric oxygen tension pressure) as noted at various altitudes indicates that optimum oxygenation of the body tissues is necessary for the maintenance of organic health.

A low oxygen pressure in the arterial blood is characteristic of emphysema, congenital heart disease, Ayerza's disease, chronic carbon monoxide poisoning, chemical poisoning and repeated small hemorrhages.

The blood of the body holds approximately 1,200 cc. of oxygen, which is used by the tissues in approximately five minutes at rest and in a fraction of a minute at work.

Experiments cited by Best and Taylor[2] indicate a high degree of sensitivity on the part of the heart muscle to any reduction of available oxygen. Recognition of this principle is the basis of our present method of supplying adequate oxygen to patients with morbid cardiac-conditions. In work the demand of the heart muscle for approximately 40 cc. of oxygen per gram per hour and its refusal to produce without oxygen give some weight to the idea that there may be a relation to the very high degree of resistance of the heart

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Submitted for publication Aug. 18, 1950.

muscle even to metastatic carcinoma The heart soon refuses to function when lactic acid reaches a concentration of 0 07 per cent, whereas skeletal muscle will continue to contract in the presence of a lactic acid concentration of 0 2 per cent

The concept of what is meant by cellular oxidation is clear enough as an abstract principle, but the exact mechanism in the body as compared with laboratory mechanisms, under conditions of work as compared with rest, and under conditions *of unfavorable environment, such as a* morbid body process, is variable and not completely understood There is some difference of opinion as well as a great variation in different tissues and a considerable variation in similar tissues that have dissimilar functions In connection with variable tissue metabolism, the illustration cited by Greenstein[1] in his chapter on the chemistry of tumors is interesting "The metabolic pattern is as distinguishing a feature of each tissue as is the gross and microscopic morphology and constitutes a functional characteristic of the tissue Each of the enzymes behaves qualitatively much the same way in all tissues Quantitatively, however, the distribution of the enzymes varies in each of the tissues, and it is this quantitative distribution which constitutes the individual *mosaic of each tissue* "

High cystine disulfurase activity	Pancreas
Plus high arginase activity	Liver
Plus alkaline phosphatase activity	Kidney
Bone	Very high activity of alkaline phosphatase
Intestinal	Neither much catalase nor much arginase
Mucosa	Very high esterase as contrasted with bone

Thus macerated tissue may be identified *in the test tube the same as inorganic* chemicals [3]

Greenstein has stated reasonably that it is useless to compare tumor tissue with the normal tissue from which it arises, but that it should be compared with the corresponding fetal tissue or regenerating tissue

In the higher animals there are three *well developed systems of oxidation These* are the aerobic system, in which molecular oxygen is supplied to the tissues, and two anaerobic systems, one of which (the more nearly normal) is motivated by enzymes, the other by the process of fermentation All three forms of oxidation conform to the principle that the oxidation of a substance entails the loss of one or more of its electrons [2b]

Greenstein stated that "   most of the tumors which have been studied appear to obtain a considerable part of their energy from fermentation processes "[3b]

Best and Taylor stated that "   skeletal muscle, embryonic tissues, malignant tumors, cartilage, intestinal mucosa, *the medulla of the kidney, depend in vary*ing degree, in some cases predominantly, upon an anaerobic mechanism for energy liberation " They further stated that in muscles the anaerobic mechanism is an emergency process and that from nine to twelve times as much carbohydrate is required to produce a given amount of energy in an anaerobic as in an aerobic environment "When the supply of oxygen is insufficient for cell respiration, the anaerobic mechanism comes into operation and large amounts of the products of fermentation are formed In the presence of oxygen, the accumulation of anaerobic products is diminished in varying degree, depending on the supply of oxygen, the nature of the cells and other factors [4]

"This suppression of fermentation by *oxygen has become known as the 'Pasteur* effect', since it was first observed by Pasteur in the case of yeast many years *ago" "The 'Pasteur effect' is observed* only in cells and tissues whose metabolic type is intermediate between these two extremes", *that is, purely aerobic or ex*clusively anaerobic Dixon, Burk, Stern and Lipman have written of the "Pasteur *effect*"

The mechanism by which oxidation of the metabolites of the tissue cells is motivated is under close study by a number of investigators and has been for the last forty or fifty years (Best and Taylor) but there is still sufficient difference of opinion to indicate that much work remains to be done. The fact that cellular metabolites are stable in oxygen at the pH and temperature levels compatible with life indicates that the process is probably mediated by enzymes, as are most of the other economical body processes. These catalytic systems (as outlined by Best and Taylor) are divided into a number of different groups: (*1*) Dehydrogenases whose function is indicated by the name, (*2*) the oxygen activation group, and (*3*) vitamins and hormones.

As at present conceived, then, the processes of cellular oxidation are accomplished (*1*) by addition of oxygen, (*2*) by the removal of hydrogen and (*3*) by the withdrawal of one or more electrons.[4b] The third of these systems is the most complicated and is the conversion of ferrous to ferric chloride.

It remained for Keilin to coordinate and harmonize the apparently conflicting theories of Warburg and Weiland as to the control of cellular oxidation in 1929 and 1930. The iron-porphyrinprotein complex or cytochrome oxidase or respiratory enzyme (of Warburg) appears to be the mediator or link between the other factors of the system.[4c]

"At least three water-soluble vitamins are known to be very closely related to oxidative catalysts present in animal cells. Nicotinic acid in the form of its amide constitutes part of the pyridine nucleotides; riboflavin is a component of the flavoproteins; the active form of thiamin is thiamin pyrophosphate". Thiamin appears to assist in oxidative and other processes involving pyruvic acid.

"Each of the three vitamins, therefore, enters into the formation of an essential oxidation catalyst, in animal cells, having the essential properties of a prosthetic group or of a coenzyme associated with a specific enzyme protein. In all three cases dietary deficiency of the vitamines has been shown to cause a corresponding diminution of the amount of the corresponding catalyst in certain tissues of the deficient animal."[2b]

The more recent work of Scent-Gyorgyi involves the catalytic role of C4-dicarboxilic acids; that of Krebs, a cyclic mechanism for the oxidation of pyruvic acid.[2c]

There is an expression which is so frequently heard that it has become accepted as the proper means of indicating an environmental situation existing in the presence of cancer or prior to its development; it is a reference to a known or unknown "irritant." The expression is used quite uncritically, because cancer is so often encountered in association with a process involving mechanical irritation or a low-grade chronic infectious irritant. There is no proof that even the so-called chemical carcinogenic agents are truly carcinogenic. They may be only predisposing factors setting up an abnormal physiologic condition, e.g., of oxidation, whereas the true carcinogen can induce morbid cell growth. As a means of further emphasizing this point, I shall cite a number of accepted cancerous and precancerous situations and assert that nearly all can be explained on the simple hypothesis that deficient oxidation of individual cell elements in a tissue can take the place of the present pantheon of so-called carcinogenic agents, but only as a predisposing factor, leaving the specific carcinogenic agent no less and no more of a mystery than it is at present.

"Cancer of the lip is an extreme rarity in women, but not infrequent in men."[5c] The pressure of the pipe stem, particularly the hot clay pipe stem, is cited as a typical carcinogenic "irritant." Could it not well be that the pipe stem merely sets up a chronic irritation with round cell infiltration and induration, which interferes with the oxidation of the adjacent cells, increasing their susceptibility to the action of some as yet unidentified specific etiologic factor, by disturbing their normal metabolic processes?

"Cancer of the skin of the ear occurs ten times as frequently in men as in women." Here again appears the factor of chronic irritation due to weathering and mechanical irritation setting up a barrier to the normal oxidative processes of the local tissues

In general it may be said that primary carcinoma of the liver is rare However, among orientals it is fairly frequent [1] There will probably be no disagreement as to the reason, namely, infestation of the liver by tropical parasites

The question is Is the action that of an irritant on cells destined to become cancerous, or is the action merely the setting up of a barrier of induration and/or edema which chokes certain adjacent tissue cells into susceptibility to the specific carcinogenic agent, whatever it may be?

A few references to research observations on the relation tumor tissue and normal tissue in the matter of oxidation are desirable in order to show their characteristic environment and physiologic characteristics Greenstein referred to the experimental work of several investigators who were able to determine that " tumors as a class of tissues were distinguished by a high anaerobic glycolosis "[3q]

"High anaerobic glycolysis appeared to be a general property of growing or multiplying tissues, since it was found in embryo tissue and testis, but in these normal tissues glycolysis was largely abolished by the presence of oxygen In most tumors, on the other hand, the high anaerobic glycolysis was relatively little reduced when oxygen was admitted to the system, the same, however, could be said of the placenta "[3r]

Greenstein called attention to his conclusion that, notwithstanding the fact that some normal tissues overlap tumor tissues in their metabolic characteristics, " if there is no evidence at present of a specific tumor metabolism, there is evidence of a uniform tumor metabolism "[3s]

Warburg's early prophecy of a deficient respiratory mechanism in tumors has been sustained by the observation of very low amounts of the cytochrome system, of catalase, of the flavin enzymes and of coenzyme in these tissues "[3t]

Another basic conclusion reached by Greenstein is interesting and significant "No matter how or from which tissues tumors arise, they more nearly resemble *each other* chemically than they do *normal tissues* or than *normal tissues* resemble *each other* "[3u] "The metabolic pattern of tumors, furthermore, is nearly similar in all species studied (*1*) a high rate of glycolysis, (*2*) an increased water content and (*3*) a low activity of cytochrome, are among the characteristics of practically all tumors in all species studied These are but a few features of what appears to be a remarkable chemical uniformity in tumors as a class of tissues, and suggests that mechanisms involved in malignant uncontrolled growth are common to all tumors regardless of etiology, histogenesis or species wherein found "[3v]

Furthermore, it is important to determine the type of cell that is most susceptible to malignant change It is the more lowly type of cell which is supposed to adapt itself to varying changes in the body or tissue structures It is the source of new cells in the event of injury, new cells which are amenable to certain physiologic stimuli calling for stepped up division or differentiation To quote again from Anderson, [6] "Fully differentiated cells such as those of the premenstrual hyperplasia and those of lactation acini do not divide and in all probability do not give rise to cancer "

Typical regeneration of tissue after injury is represented[36] by the fibrocytes of connective tissues, the osteoblasts of bone, the chondroblasts of cartilage, the regeneration of capillaries from endothelium and regeneration of muscle and connective tissue of the blood vessels from mesothelium Epithelial regeneris typical of the skin, the gastrointestinal tract, the liver and the kidneys, then, as has been mentioned, the cyclic regeneration of the endometrium and of the gland structure of the mammary glands in lactation

If the analogy between normal and malignant anaplastic cells is to be of value, some basic physiologic factors must be recognized. One of the most important similarities is the enzyme content of the tumor as compared with that of the normal parent tissue, since cellular metabolism, normal or abnormal, is controlled by their contained enzymes. On this point I may cite Greenstein, who stated[3c] ". . . most tumors appear to have qualitatively the same kind of enzymes and other components as normal tissues" (of the same kind). He stressed the fact that it is careless analysis to try to compare or contrast, for purposes of argument, the characteristics of malignant cells with normal tissue cell of a different type or function. Thus, as he again emphasizes, the malignant growth must be compared with the normal tissue of origin if any worth-while conclusions are to be reached. On the other hand, he observed[3d] that future research may reveal some definite and characteristic variation between normal tissues and corresponding malignant tissues.

Conversely, the chemical pattern, including the enzyme components, is more nearly the same in tumors as unrelated as carcinoma and sarcoma than in unrelated normal tissues. The degree of variation is also much narrower than that of normal tissues.[3e]

The specific differences in the enzymes acting as oxidases have a direct bearing on the environment most characteristically favorable to the origin and development of malignant growths.

"Tumors do not stand outside the metabolic range of normal tissue."[3f] On the other hand: "Most striking of the systems which in tumors stand at the lowest range of the normal tissues are the exidases."[3f] Greenstein expressed the opinion that normal tissues possess an as yet unmeasured enzyme reserve in, possibly, an undeveloped form, whereas "apparently tumors possess little if any enzymatic reserve of certain systems."[3f]

In "Conclusions Relating to Special Systems" Greenstein said: "One of the most striking features of the metabolism of tumors is their relatively low content of aerobic catalytic systems, i.e., cytochrome succinic and diamino acid oxidases, cytochrome, catalayse and flavin. . . ."[3g]

It is interesting in the light of experimental work done thus far to note the definite reduction in the content of certain oxidizing enzymes not only in the tumor tissue but, in the case of catalase at least, a reduction in the uninvolved tissues of the animal. These changes appear decidedly more pronounced in the case of the enzymes connected with the utilization of molecular oxygen.[3h]

Greenstein, referring to the work of Braun, mentioned: " . . . very low liver catalase values in human beings who had died of various forms of cancer. Later work showed that of all the individual enzyme systems studied in the livers of mice and rats bearing a wide variety of tumors, the activity of the catalase was by far the most affected . . . the decrease in the liver catalase is progressive with the growth of the tumor. Moreover, the effect of the tumor upon the activity of this liver enzyme was found to be reversible, for the complete removal of the tumor . . . resulted in the restoration of the catalase activity of the liver to the normal level."[3j]

"Of the various chemical approaches to the study of malignancy in tissues the solution of the problems concerned with metabolism and respiration rank among the most important".[3k] Thus one comes more and more to the realization that there is a fundamental difference of the tumor cell which it is not unreasonable to assume may have been brought about by its reaction to an unnatural environment.

To reiterate, "High anaerobic glycolosis appeared to be a general property of growing or multiplying tissues since it was found in embryonyl tissue and testis but in these normal tissues glycolysis was largely abolished in the presence of oxygen."[3l] ". . . Tumors as a class of tissues were distinguished by a high anaerobic glycolysis" (note: which is maintained even in the presence of adequate molecular oxygen.)

"The solution of the problem of cancer cannot depend entirely upon the hope of the happy and fortuitous discovery Rather, this solution is more likely to stem from the patient and systematic accumulation of knowledge of the chemical dynamics of the cancer cell It is manifestly impossible to attempt measures of rational and intelligent control of something unknown One of the most urgent tasks at the present moment is, therefore, a frank, blunt, and concerted attack upon the chemistry of the cancer cell by every available analytic resource It may well be that, once revealed, the explanation that a neo-plastic transformation may be absurdly simple and measures of control will follow readily "[1]

This paper up to this point has been exploring the recorded investigations and technical chemical and pathologic dicta touching the nature of the cancer cell I think it can now be assumed that there is some deviation from the normal[1] *before* tissue cells become frankly malignant, since the outstanding chemical change so far discovered has been a radical change in the cancer cell's capacity for maintaining its oxidation

What is the optimal relationship of the oxidation process to physiologically normal tissue and regenerating tissue as compared with neoplastic tissue? One of the oldest principles of tissue regeneration is illustrated by the shingling or pressure dressing applied over varicose ulcers Another well recognized example is use of the pressure dressing in the treatment of burns In both of these conditions healing is enhanced by depletion of blood in the tissues True enough, engorged tissues do not have an excess of arterial blood, but under conditions of pressure the arterial blood as well as the venous blood is decreased In both cases reduced oxygen supply encourages regeneration

Perhaps one should particularize "oxygen supply" in this and other examples by adding the word "molecular"

Another example, cited by Dr Longmire in a recent paper presented May 17, 1949, adds further weight to the argument that even an excess of arterial blood may hinder healing His reference was to a long-standing ulcerative condition in a cavernous hemangioma, which was encouraged to rapid granulation and healing by almost complete ligation of its arterial blood supply

One of the most striking examples of cancer developing in the presence of physiologic inactivity was presented in a discussion of breast cancer several years ago A woman had nursed several children of her own and wet-nursed a number of children for other women, 12 in all, but all on one breast The interesting point was not that cancer developed, but that it developed in the breast which had not been used This is perhaps not a perfect example of physiologic inactivity, because the breast doubtless did lactate and, not being emptied, was to that extent traumatized This point, however, does no violence to my original premise that the resulting congestion would have caused induration and a consequent lowering of cellular oxidation The number of multiparous women who have carcinoma of the breast represents a rather high percentage, and to it must be added the percentage of parous, women who have not nursed their babies

A group of statistics published in the June 1949 issue of the *British Journal of Cancer* points out the relation of occupation to cancer in the Netherlands for the years 1931-1935 A total of 51,124 cases was analyzed

In the case of cancer of the cervix, the factor of injury and induration evidently bulks larger than does the factor of physiologic inactivity, for its incidence stands at 5 92 per cent of all cancers in married women, whereas it is only 2 325 for unmarried women That, however, seems a fairly heavy percentage It is in the case of cancer of the breast and ovary that the incidence becomes greater in the unmarried The incidence of cancer of the breast was 17 06 per cent in the married as against 21 87 per cent in the unmarried

Cancer of the breast classified by occupation was much more striking, as there was a more clear-cut determination of factors. The following totals were recorded for unmarried women:

	Teachers	Nurses	Nuns	Domestics	Needlewomen
Cancer of stomach	16	15	60	132	36
Cancer of intestine	12	3	19	34	15
Cancer of breast	34	13	44	95	34

It may be that the high figure for domestics can be accounted for by the probable high incidence of mammary trauma, as well as ignorance and generally poor physical hygiene.

D. Lippert, who was in charge of the supervisory care of the prostitutes of Hamburg, Germany, stated: "Cancer of the womb occurred but once in my experience of eleven years at the General Infirmary and cases of prolapsus uteri were nil." (From *History of Prostitution* by W. W. Sanger, M.D.)

"Ninety per cent or more" of carcinomas of the thyroid originate in previously benign adenomas. The very nature of the thyroadenoma is such that there is a paucity of oxygen supply to its contents.[5h] The infrequency with which carcinoma develops in the diffusely hyperplastic gland associated with exopthalmic goiter has been noted by a number of observers.[5h]

In the stomach, atrophic gastritis, pernicious anemia, and (by some) peptic ulcer are considered predisposing factors.[5i]

In cases of cirrhosis of the liver, 3 to 7 per cent of the patients eventually have cancer.[5j] (Here there is an excessive amount of fibrous tissue cutting off the normal blood supply of the secretary and endothelial cells. In cholangiomas the connective tissue is dense and contains few capillaries.[5j]

Carcinoma of the breast: "A history of few pregnancies with irregularity of lactation is commonly elicited."[5k]

Adenocarcinoma of the breast is characterized by "an extremely hard, fixed, infiltrating nodule" and having "a dense hyalinized stroma with narrow, elongated columns of epithelial cells."[5l] In carcinoma simplex, the groups of cells are described as surrounded by dense stroma.[5m] In the comedo type, "adjacent breast tissue is generally atrophic."[5m]

In Paget's disease there is a chronic eczematoid inflammation of the nipple. Microscopically there is marked hyperkeratosis with vacuolated, pale, degenerative cells. The cells beneath the nipple are indurated.[5m]

In mucoid carcinoma the epithelial cells "are generally poor in detail, apparently because of mechanical pressure. The paucity of cells in the large mucoid masses is an expression of restraint of growth."[5m]

"Nulliparous women have a higher incidence of breast cancer than multiparous women."[3o]

"In neoplasms of the respiratory tract, Anderson argues that there is no real proof of derivation from alveolar epithelium but rather from bronchiolar epithelium"[5p] (Note the area of relatively poor blood supply and physical inactivity with frequent induration due to infections and/or mechanical and chemical irritants with their accompanying induration.)

"Primary tumors of the spleen are rare." "The frequency with which the spleen is involved secondarily by tumor formation is slight when we consider its high degree of vascularity. The reason for this infrequent involvement is not understood... Whether tumor cells reaching the spleen are destroyed more readily than in other organs is a question that has never been settled."[5q] Note: one thing is certain, and that is that there is an abundant supply of molecular oxygen present.

Of rabbits, Greenstein stated: "It is quite striking that the papilloma agent, introduced humorally finds its way to the site of injured and benignly neoplastic tissue and there induces malignant growth."[5p]

Anderson[5r] referred to the well known irritants which have long been recognized as etiologic in malignant change, such as pipes (especially clay) in lip cancer, soot in scrotal cancer in chimney sweeps, tar, Cashmir charcoal heaters in malignant disease of the abdominal wall, actinic rays and blond skin, old scars, osteomyelitis, and syphilitic leukoplakia In this connection he mentioned "the unexplained cancerous irritant that is present in old scars as from burns or osteomyelitis, the 'vague irritant' of syphilitic leukoplakia and a variety of others" "However," he added, "in most instances of squamous cell carcinoma the source of irritation or stimulation is not apparent"

In those cases in which an irritant is apparent, even though their variety is almost uncountable, there is one factor which stands out induration, with its concomitant and resultant decrease in normal blood supply after the initial congestive phase has subsided This decrease in normal blood supply results in a decrease in molecular oxygen and also in the vitamin elements which are an important factor in the enzyme phase of normal oxidation

Now let us turn to the basal cell group of cancers in which "the source of irritation or stimulation is not apparent" Those on the face are said to be bounded for the most part by "the hair line, ears and upper lip" It is admitted that this is the area most exposed to climatic elements and also that the process is more common in men than in women There are other factors operating in this area, however, that may well be considered (1) the greater activity of the sebaceous glands about the nose, (2) moisture about the eyes, (3) relatively poor circulation of the ears, and (4) the habit of men of neglecting effective cleansing of the face in washing because a washcloth irritates the beard, as a result the central part of the face is also neglected, the glands become clogged, irritation is set up and again one notes engorgement and poor oxidation as predisposing factors Women, on the other hand, are more fastidious and also are not so much exposed to the elemental sources of irritation

"   About 50 per cent of carcinomas of the vulva are preceded by chronic atrophic vulvitis"[34]

Dr Ian MacDonald, assistant professor of surgery at the University of Southern California, expressed the opinion that cancer of the mouth and stomach is favored by a diet deficient in B complex (This could be further explained as due to deficiency in the cellular oxidation, dependent on B complex elements or secondary to mucosal atrophy)

If the foregoing arguments and data give reasonable credibility to the idea that cellular vulnerability is enhanced by conditions disturbing local circulation, not neglecting any possible inherited tendencies, then consideration should be given to the practical application of prophylaxis by the physician

Heretofore, attention has been concentrated on processes which were in an active state of irritation, such as chronic cervicitis and active ulceration of the stomach These processes are now even more to be questioned, but the quiescent, previously active, inflammatory or scarred areas—the so called "healed processes"—should be watched and carefully explored if there is the slightest question It would emphasize the importance of elimination of the thyroid adenoma and also the cervix uteri when hysterectomy is performed, even though it may "look" normal As was recently pointed out, the mortality expectancy of routine total prophylactic hysterectomy would be less than the mortality from cancer at present (Meigs, Surg, Gynec & Obst 90 137) Another case in point is the large pendulous breasts in middle aged women, which are apt to be subjected to excessive pressure and the heat of close confinement by brassieres, or, on the other hand, frequent trauma from physical activity (note the cancer expectancy in the case of domestics in the Belgian statistics previously cited) It would lend more weight to the belief that gallbladders containing calculi should be removed even though the condition is apparently quiescent Leukoplakia should be looked upon with a more jaundiced eye than formerly Sessile excrescences in the colon and rectum should be treated and watched with added intensity Carcinoma in situ assumes added importance So-called benign cutaneous growths in later life also should be given more attention than heretofore by the average physician.

"Rarely, if ever, does cancer arise in previously normal tissue."

SUMMARY

In discussing the relation of cellular oxidation to carcinoma, the author points out the possibility that many supposedly carcinogenic factors merely predispose to carcinoma by setting up a suitable environment. The presentation emphasizes Anderson's pronouncement, "It is rare that cancer appears in previously normal tissue."

RÉSUMÉ

Dans une discussion des relations de l'oxydation cellulaire avec le cancer, l'auteur souligne cette possibilité que plusieurs supposés facteurs cancérigènes se font que prédisposer l'entourage au cancer. Cet article ne fait que rendre plus emphatique cette citation d'Anderson: "à savoir que le cancer se trouve rarement dans du tissu normal."

RESUMEN

Al discutir la relación de oxidación celular a carcinoma, el autor puntualiza la posibilidad de que muchos de los factores que se suponen carcinogénicos sólo predisponen al carcinoma por situación en medio adecuado. Se invoca la sentencia de Anderson —Es raro que el cáncer aparezca en tejido normal.—

RIASSUNTO

Nel discutere la relazione dell'ossidazione cellulare a carcinoma, l'A. propone la possibilita' che molti fattori supposti carcinogenici semplicemente a carcinoma presso di costruire, predispongono contorno convenevole. La presentazione da enfasi al pronunciamento di ANDERSON, "E raro che il cancro apparisce nel tessuto normale."

ZUSAMMENFASSUNG

Der Verfasser eroertert die Beziehung zwischen Zelloxydation und Krebs und hebt hervor, dass moeglicherweise viele sogenannte krebserregende Faktoren eigentlich nur die Disposition fuer die Entstehung eines Krebses schaffen, indem sie ein geeignetes Milieu hervorrufen. Die Arbeit legt Nachdruck auf Andersons Ausspruch: "Krebs entsteht nur selten in gesundem Gewebe."

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Announcement

International Board of Occupational Surgery

The Executive Council of the United States Chapter and the Board of Trustees of the International College of Surgeons have unanimously approved the formation of an International Board of Occupational Surgery, the aims of which are (*a*) elevation of standards for the practice of occupational surgery, (*b*) conservation of the health of the worker after occupational injury, (*c*) official recognition of this specialty, (*d*) stimulation of interest in this field by students and members of the profession, and (*e*) cooperation in the establishment of facilities for graduate education in occupational surgery by means of residencies in hospitals affiliated with medical schools, or their equivalents

Frederick W Slobe, M D, F A C S, F I C S, Chairman

L C Holmblad, M D, F A C S, Secretary

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A Metallic Femoral Head Prosthesis for the Hip Joint

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THE mechanics of the hip joint, involving the anatomic and physiologic characteristics of the acetabulum, head, neck and trochanter of the femur, create difficulties in surgical reconstruction that have stimulated continued efforts toward improvement.

A more satisfactory solution of the problem of surgical treatment is still sought for such conditions as (*1*) fractures of the femoral neck in the extremely aged; (*2*) aseptic necrosis of the femoral head and neck; (*3*) painful partial ankylosis of the hip; (*4*) disabling deformities of the femoral head and neck, and (*5*) tumors requiring excision of the femoral head and neck.

A practical substitute, an internal prosthesis not too difficult to introduce and dependable enough to permit unharmful weight bearing within two or three weeks, would be a logical solution in many instances when these clinical complications are involved.

Bohlman and Moore first applied a complete substitute vitallium prosthesis, consisting of a spherical head, a neck and a sleeve bracket to slip over the femur. It was fixed with screws. Hudack also has made some interesting observations on joint replacement. Judet has used an acrylic head mounted on a metal pin to be inserted into the distal portion of the femoral neck and the trochanter. Peterson has described the collision prosthesis, an assembled head and neck substitute proposed by Jaenichen, which is bolted through the distal portion of the femoral neck and the trochanter.

The Extremely Aged.—An internal prosthesis for immediate replacement of the fragments of the fractured neck of the femur should be a valuable asset for the extremely aged patient, who is subject to all the uncertain surgical consequences of healing, such as failure of union or aseptic necrosis. The long protective period of limited weight bearing is just as essential for the aged as for younger persons. Total incapacity may result from the physiologic interruption of normal systemic functions in the aged person, even though the early surgical treatment of the hip is considered successful. When union fails or aseptic necrosis occurs, the physiologic capacity of the aged person, which has already been overtaxed, is in poor condition to withstand further surgical reconstructive procedures, which again call for long-continued inactivity. A substitute prosthesis should permit weight bearing in two to three weeks.

Aseptic Necrosis.—In the presence of aseptic necrosis of fractures of the femoral neck, the choice of a substitute internal prosthesis would, in many cases, be preferable to any of the surgical reconstruction operations, which often, at best, result in a painful hip or in unsatisfactory locomotion. Furthermore, even after the most promising surgical reconstruction has been accomplished, physiologic repair is still a threat to satisfactory restoration of function.

Ankylosis.—The surgical treatment of ankylosis of the hip, for which arthoplasty is indicated, has passed through evolutionary stages in which various intervening substances have been used to prevent readherence of the excised tissues. Complete excision of the head of the femur and the substitution of a prosthesis with a spherical head has received but passive

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consideration until recently If such a prosthesis can be satisfactorily joined to the femoral trochanter and shaft to permit dependable and permanent resistance to the effect of functional activity, the resulting motion and weight-bearing strength would far exceed that provided by the use of intervening substances

Deformities —A suitable substitute internal prosthesis would be ideal for the painful arthritic hip, or for such disabling deformities as the mushroom head There is always stormy opposition to stiffening the hip Fusion admittedly relieves the pain, but successful bony fusion is not readily obtained, and in many cases the long period of postoperative immobilization is of permanent detriment to function

Tumors — Tumors requiring extensive or complete excision of the femoral neck create a situation in which substitution of an internal prosthesis also is highly desirable

Hip Prosthesis —The following requirements should be met

1 The technic of application should not require time consuming details of measurement and mechanics

2 Construction also must be practical and not too complicated mechanically

3 Fixation to the femur must be permanently stable and dependable Atrophic, friable bone should not be a restriction to application of the prosthesis

4 Adequate motion should be permitted without pain or possibility of displacement or impingement

5 The muscle-propelling forces must be maintained

6 Shortening of the leg must be kept at a minimum

7 Stability and weight-bearing support must be dependable for necessary practical functions of the hip

8 The substances used for the prosthesis must be enduringly tolerable to the tissues

9 A long period of immobilization by plaster, *or by other means, should not be* necessary, because of such factors as age, muscle atrophy and other results of disuse

The Door-Knob Hip Prosthesis — The author has devised a prosthesis which successfully meets the aforementioned requirements It is nicknamed the "doorknob hip " It is a single unit that requires no assembly or special tools Its use involves no more surgical trauma than does use of the Whitman reconstruction operation The material is vitallium, or No 317 stainless steel, which is absolutely nonelectrolytic The prosthesis consists of a head, a neck, a supporting disk, a trochanteric support and a threaded intramedullary shank It is locked against rotation by a small metal block with a set screw, firmly fixed to an accurately shaped notch in the upper edge of the bone shaft A hooked support and a screw fix the transplanted trochanter and its attached muscles to the femur The threaded shank, about 6 inches (15 cm) in length, is self-cutting and is shaped to screw snugly, by hand and wrench, into the medullary canal It is adjustable to the right or the left hip The head is shaped somewhat like a door knob It is spherical except for a slightly flattened surface designed

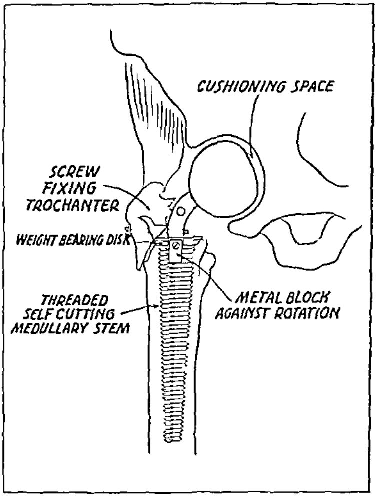
CUSHIONING SPACE
SCREW FIXING TROCHANTER
WEIGHT BEARING DISK
THREADED SELF CUTTING MEDULLARY STEM
METAL BLOCK AGAINST ROTATION

Fig 1 —Mechanical design of prosthesis

Results of Use of Prosthesis in 12 Cases

Patient No.	Sex	Age	Date of Fracture	Type of Internal Fixation	Previous Operations	Date of Application of "Door-Knob Hip"	Condition at Last Visit
1	F	65	1/15/47	None	10/8/47 Transverse subtrochanteric osteotomy	8/5/49	2/7/50: Walks well without support; full motion; full length; does housework; can sit, rise and cross knees readily; moderate soreness
2	F	60	11/8/47	None	11/9/48 Whitman reconstruction	3/3/49	1/25/50: Can bear considerable weight but lacks strength; walking on crutches; good motion; no pain; considerable bony atrophy
3	F	58	1/24/48	Pinned 1/27/48; screw 6/6/48; bone graft 6/16/48		4/15/49	11/21/49: Walking without support; good gait with very little limp; hip motion practically normal; hip sore and hurts when twisted; doing housework without crutches
4	F	81	7/19/47	None	11/7/47 Transverse high osteotomy	7/13/49	By letter 7/29/50: Walks with stick support; good motion; soreness; no other pain
5	M	58	8/2/47	Plates and screws—no dates	Removal of sequestae and plates (5)	11/17/49	5/17/50: Amputation; irreversible chronic osteomyelitis
6	F	70	10/3/47	Smith-Petersen nail, 10/5/47	None	12/24/48	1/25/50: Walking without support; can bear full weight but cannot balance too well; full motion; full length; knee weak; can sit and rise readily; cannot cross knees without assistance
7	F	72	12/27/48	Pinned Jan. 1949	None	1/25/50	4/7/50: Does not attempt to help herself; walks with a support; no acute pain on motion; good weight bearing without pain
8	F	77	5/10/49	Smith-Petersen nail, 5/12/49	None	9/15/49	1/24/50: Walking well; full motion; full length; lacks confidence; moderate soreness; uses stick; can sit, rise and cross legs readily
9	F	73	7/3/49	Pinned 7/6/49	None	9/8/50	10/15/50: Good range of motion; fairly free of pain; on crutches
10	F	81	2/3/50	Smith-Petersen nail, 2/6/50	None	5/12/50	9/15/50: Walking freely on crutches; no pain in hip; almost normal motion; leg length about normal
11	F	72	4/22/50	None	None	7/25/50	8/9/50: Good motion; on crutches
12	M	46	3/18/43	Smith-Petersen nail, Aug. 1943; another Smith-Petersen nail, no date	1943-44, bone graft	8/4/50	10/18/50: Good motion; some weight bearing; still on crutches; no pain

to prevent pressure on the tender cotyloid notch area of the acetabulum. This flattening also creates a cushioning pocket that relieves friction.

The head is made in various sizes and the neck in various lengths, approximating the head and neck of the femur for which it is to be substituted. The size should be selected to fit the acetabulum rather loosely. The length of the neck

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should be such that the stress in reduction of the head and the linear tension of the head in the acetabulum will not be too great The neck of the prosthesis fulfills the requirements of length of the head and neck of the femur but is shaped at an angle about 15 degrees more obtuse than the normal angle of the neck of the femur This transmits a more direct weight-bearing line from the roof of the acetabulum through the head and into the shaft of the femur, thus eliminating ligamentous stress and muscular strain in maintaining equilibrium, motion and weight bearing The disklike metal ledge is large enough to rest on the hard cortical bone on the cut end of the femoral shaft and thereby absorbs the greater portion of weight The intramedullary shank is coarsely threaded as a self-cutting screw It is large enough in diameter to occupy, tightly, the medullary canal without cutting into the cortex.

No especial apparatus is needed for seating the prosthesis except a simple wrench to assist the hands in turning the apparatus, which is smooth and becomes slippery A reamer of suitable size may be used to start the threaded shank in the right direction into the medullary canal A screw hole and a square-cornered notch are placed on the anterior and posterior aspects of the weight bearing disk to receive a metal block and set screw which fits into the notch in the bone shaft of equal size to prevent rotation

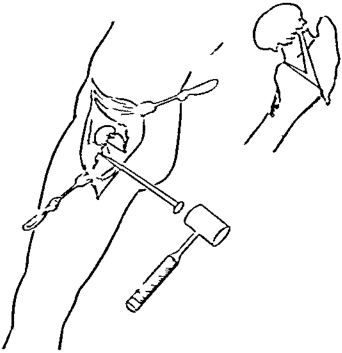

Fig 2—Osteotomy of trochanter, preparatory to introduction of prosthesis

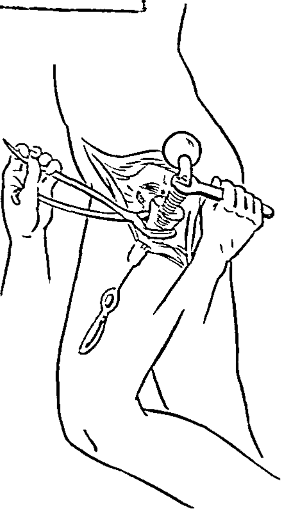

Fig 3—Method of introducing self-cutting threaded stem into femoral medullary canal

Technic—The entire leg and hip should be prepared in sterile drapes for free manipulation The incision must be one that exposes the lateral aspect of the trochanter as well as one that permits removal of the femoral head If there is an old scar from a previous lateral incision, it should be excised and the incision extended forward to the anterior-superior spine If there is no scar and if the fatty thickness of the hip is not too great, the lateral U incision is preferable (Some prefer Gibson's posterior approach) The capsule is incised lengthwise to elevate it freely from the head, neck and trochanter The trochanter is freed sufficiently to outline its contour, and all muscle attachments are left All previously applied metallic fixation pins or screws are removed A wide thin osteotome is then [illegible] transversely at the

Fig. 4.—Roentgenographic appearance after introduction of prosthesis.

upper margin of the lesser trochanter, and the greater trochanter is separated from the shaft. The greater trochanter is levered upward to permit removal of the femoral head. Some of the neck may be trimmed away to add space. A Campbell curved hip arthroplasty chisel is useful in removal of the head. The capsule is preserved as well as possible, even though considerable dissection is required during removal of the head.

The proper size of the substitute head is selected by inserting metal heads of different sizes into the acetabulum and testing for snugness. Reaming of the acetabulum is unncessary except where there is overgrowth or unevenness. The proper length of neck on the prosthesis is determined by placing traction (without undue leverage or force) on the extended leg to judge the prospective resistance to reduction. The upper end of the femoral shaft is then forced out into the wound by adduction, rotation and upward force, to permit screwing the shank of the prosthesis into the medullary canal. Subperiosteal dissection and retraction should be extensive enough to permit free rotation of the head and neck of the prosthesis as it is screwed into the femoral shaft. A 3/8 inch (0.96 cm.) reamer may be used to find the true direction into the medullary canal. The prosthesis is turned by hand until it binds; then the femur is held with a Lane forceps while a wrench is used on the prosthesis. The weight-bearing disk must be firmly and evenly seated on the cut end of the femoral cortex. If binding occurs, the threaded shank is rotated back and forth so that the threads will cut their way. The bone may be shaped to make it level with the weight-bearing disk before tightening. The appropriate forward angle of the head and neck is determined by comparing leg alignment. The head is reduced into the acetabulum by means of a long spoon lever and hand manipulation by an assistant. Undue leverage or force may fracture the femoral shaft. A notch is cut out of the anterior aspect of the cortex to permit accurate fitting of the metal block that is to prevent rotation. This metal block must be firmly seated with a screw. There must be no looseness at this point. The leg should be abducted for reattaching the trochanter. As the trochanter is pulled outward and downward, it is levered over the projecting hook, which aids in holding the bone in position for inserting the screw that binds its lower portion against the previously scarified cortex of the femoral shaft. The fixation screw can be forced or tapped through the soft trochanteric bone at a point that will meet the screw hole and at the same time permit overlapping of the trochanter 1/2 to 3/4 inch (1.3 to 1.9 cm.) on the shaft. The capsular tissues and deep fascia are closed with No. 1 chromic sutures, and the remainder of the wound is closed by the whatever is preferred. No case is applied. Buck's extension (10 pounds, or 5 Kg.) is used for five days with the leg in wide abduction and sandbags applied to prevent rotation.

The patient may be turned by maintaining abduction. Exercises are begun after five days. The patient is given crutches in ten days, and moderate weight bearing may be permitted in two weeks Special attention should be given to exercises which develop the rotators and abductors

SUMMARY

A hip joint prosthesis with a spherical head, designed as a single unit and fixed by a threaded intramedullary stem, is described, together with indications for its employment Over a period of three years its use has given rise to no disappointing complications Twelve cases are statistically reported, all with good results

RESUME

L'auteur *decrit une prosthese* a tete spherique pour la hanche, cette prothese et fixee a l'aide d'un pivot intramedullaire, *ainsi* que les *indications pour son emploi* sont enumerees L'emploi de cette prosthese chez un malade observe pendant les trois dernieres annees ne donna aucune complication decourageante L'auteur rapporte 12 cas, dans tous ces cas, les resultats furent bons

RIASSUNTO

Se descrive una protesi pella giuntura dell'anca a teste sferica, disegnato come unito solo e fissato d'un fusto filato intramidollare nello stesso tempo l'indicazione del'avvantaggio L'impiego durante piu di tre anni ha prodotto in nessun caso complicazione scoraggianti Dodici casi vengono rapportati in cui i risultati furono buoni

ZUSAMMENFASSUNG

Es *wird eine kugelkoepfige* Hueftgelenksprothese, die aus einem einzigen Stueck besteht und mit Hilfe eines gewundenen intramedullaeren Stieles befestigt wird, beschrieben Gleichzeitig werden die Indikationen fuer ihre Anwendung angegeben In dreijaehrigem Gebrauche haben sich keinerlei enttaeuschende Komplikationen *ergeben* Es *werden zwoelf* Faelle mit durchwegs guten Ergebnissen berichtet

RESUMEN

El autor describe una protesis de la juntura de la cadera con cabeza esferica, calculada como unidad sola y fijada con tallo intramedullar enhilado, y indica el uso Los resultados observados durante tres años no mostraron complicaciones desfavorables Refiere doce casos estadisticamente en los cuales los resultados fueron buenos

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Case Report

Fatty Bilateral Inguinal Hernia

EARLE I. GREENE, M.D., F.A.C.S., AND J. MAJOR GREENE, M.D., F.A.C.S., F.I.C.S.
CHICAGO

IN the differential diagnosis of inguinal hernia, fatty hernia should be considered. This type of hernia is very rare, only 1 case having been reported in the last twenty years. Although the management of the condition is similar to that of the ordinary hernia, the prognosis is far better than for the other types of inguinal hernia.

Small fatty pads found during operation for indirect inguinal hernia are fairly common. We have found approximately the same percentage as reported by Speed, who in 154 herniotomies observed 73 cases, or 47.4 per cent, in which fatty masses were closely associated with indirect inguinal hernias. Speed further classified these masses as follows:

1. Long pedunculated masses, slightly lobulated and covered with a more or less true peritoneal-like covering which looked like a very thin sac, taking its blood supply from above.
2. Broad, bulging masses originating behind the cord at the internal ring and bulging out in the general direction of the cord, lying posterior to it.
3. Distinct fatty masses incorporated in the tissues of the cord, with an attenuated neck at the internal ring.

These fatty masses may arise from the preperitoneal fat or may come down the inguinal canal concomitantly with the descent of the testes.

In discussing the differential diagnosis between the usual inguinal hernia and the fatty inguinal hernia, Watson stated that the fatty hernias do not change in size and are irreducible, and that no impulse is present on coughing.

We desire to present a case of bilateral fatty inguinal hernia simulating bilateral indirect inguinal hernia.

REPORT OF CASE

A man aged 35 consulted us because of indefinite dragging pain, with enlarging masses in both groins. These complaints had been present for nine months. He had previously consulted a physician, who had told him he had bilateral inguinal hernia.

The past history and physical examination gave essentially negative results. There was bilateral enlargement of the external inguinal rings. A soft bulging mass, easily reducible, was felt distal to the left external inguinal ring. Coughing or straining forced this mass further through he external inguinal ring. On the right side a similar mass could be palpated just distal to the external inguinal ring, but only on coughing or straining. This mass was also reducible.

The patient was advised that he had bilateral indirect reducible inguinal hernia, and surgical intervention was recommended. He was examined again one month later, when, in addition to the former observations, the masses were found to have increased somewhat in size and to have protruded further through the external rings.

With spinal anesthesia, a right inguinal incision for repair of the hernia was made. The aponeurosis of the external oblique muscle was markedly thinned, and in areas the fibers were separated from each other. The aponeurosis was opened along the course of its fibers, from the external ring to the internal ring. The cord was identified in the region of the external ring and freed from the surrounding strictures.

A pad of fat measuring about 8 by 5 cm. completely filled the right inguinal canal and protruded beyond the external ring. An attempt to locate a peritoneal sac failed. The

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From the Department of Surgery, Chicago Medical School, and Mount Sinai Hospital.

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fat pad, which lay anterior to the cord structures, was separated from the vas deferens and the spermatic vessels The fatty mass was dissected well beyond the internal ring and removed Its blood supply came from the preperitoneal region and not from the vessels of the cord No direct or indirect hernial sac was found A Ferguson repair was done On the left side a similar condition presented itself The fat pad was larger, measuring 11 by 6 cm, and protruded well beyond the external ring This fat pad filled and dilated the entire inguinal canal, causing separation and thinning of the fibers of the aponeurosis of the external oblique muscle The fat pad, its blood supply derived from the preperitoneal region, was dissected from the vas deferens and vessels of the cord and removed well beyond the internal ring Neither a direct nor an indirect inguinal hernial sac could be found An operation similar to that performed on the right side was done

SUMMARY AND CONCLUSIONS

Fatty inguinal hernia, though rare, should be considered in the differential diagnosis of inguinal hernia These hernias increase in size, are reducible and may give an impulse on coughing

Treatment consists in complete removal of all fatty masses and the performance of a Ferguson repair

RÉSUME ET CONCLUSIONS

Meme si elles sont rares, le diagnostic entre une hernie inguinale graisseuse et une hernie inguinale ordinaire doit se faire Ces sortes d'hernies augmentent de volume, sont reductibles et donnent meme a la toux une impulsion

Le traitement consiste dans l'ablation complete de la masse graisseuse et dans l'application de la technique de Ferguson

RESUMEN Y CONCLUSIONES

La hernia inguinal adiposa, aunque rara, debe de considerarse en el diagnostico diferencial de la hernia inguinal Estas hernias aumentaran de tamaño, son reducibles y pueden dar impulso al toser

El tratamiento consiste en la extirpacion completa de todas las masas adiposas y efectuar una reparacion de Ferguson

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

In der Differenzialdiagnose des Leistenbruches sollte auch die Fetthernie, die zwar selten vorkommt, beruecksichtigt werden Diese Brueche nehmen an Groesse zu, sind reduzierbar und geben beim Husten einen tastbaren Stoss

Die Behandlung besteht in einer voelligen Entfernung aller Fettmassen und in einer Wiederherstellungsoperation nach Ferguson

RIASSUNTO E CONCLUSIONI

Ernia inguinale grassa, sebbene rara, dovrebbe essere considerata nella diagnosi diferenziale di ernia inguinale Queste ernie cresceranno in grandezza, sono riducibile e possono dare un impulso nel tossere

Il trattamento consiste nel rimovimento completo di tutte masse grasse ed esecuzione d'un riparamento di Ferguson

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Editorial

The Meaning of Hippocrates in the Medical World Today

Hippocrates Prize Essay

S. V. HUMPHRIES, M.A. (CANTAB.), M.R.C.S. (ENG.), L.R.C.P. (LONDON)
LONDON, ENGLAND

HIPPOCRATES initiated the scientific approach to medicine. He stipulated that "a person possessed of proper ability, and knowing the discoveries which have been made, should proceed from them to prosecute his investigations." He condemned the former practice of "rejecting and despising" past discoveries, then attempting to pursue another course and form of enquiry. Any one adopting this procedure who claimed to discover anything was, he maintained, deceiving himself and others.

"The prime object of the physician in the whole art of medicine should be to cure that which is disease; and, if this can be accomplished in various ways, the least troublesome should be selected, for this is more becoming a good man, and one well skilled in the art, who does not covet the popular coin of base alloy." This quotation sums up the attitude of Hippocrates toward his patient; to cure, not to impress them, and to do so by the most direct and straightforward method.

Hippocrates abhorred the spectacular except when it was beneficial to the patient. In discussing the treatment of kyphosis following an old fracture of the spine, he stated that the gibbus deformity could seldom be straightened, and that succussion, or shaking the patient (a popular form of treatment in those days), had, as far as he knew, never straightened any spine. Succussion was a particularly spectacular procedure which consisted of securing the patient to a ladder which was hoisted by ropes up to a high tower, the gable end of a house, or the mast of a ship, the patient often being suspended face downward. The other ends of the ropes were passed over pulleys down to men on the ground entrusted with the task of succussion. By letting go their holds on the ropes suddenly, the patient was allowed to fall through space. By again grasping the ropes, his headlong fall was arrested.

This impressive but valueless performance was condemned by Hippocrates, who explained that it was principally practiced by physicians who sought to astonish the mob, but those whom he had known had all been stupid. Others, he explained, sought to impress their patients, and, in his description of the treatment of fractures of the nose (a serious subject in ancient Greece, where profiles were of

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Editor's Note: Mr. S. V. Humphries, winner of the recent Journal competition for the best essay on Hippocrates, was born in 1907 in Middleburg, Cape Province, South Africa. He was educated at Highbury, Hillcrest and Michaelhouse, Balgowan, Natal, and studied medicine at Pembroke College, Cambridge, England, and at St. Thomas' Hospital in London. He was qualified in 1932. Subsequently he held appointments at the Royal Dock Hospital, London; Hope's Hospital, Salford, and Addenbrooke's Hospital, Cambridge. He was Medical Officer to the Van Dyk mine, Transvaal, South Africa, from 1936 to 1949, except for three years' war service in East and North Africa with the 15th Field Ambulance, South African Medical Corps. He returned to Britain in 1950 and is now engaged in medical journalism.

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great importance), he poured scorn on those physicians who "gloried" in applying complex bandages for such fractures For a day or two the patient was satisfied, after which he complained of the encumbrance of the bandage The physician was satisfied because he had had an opportunity of showing his skill in applying a complex bandage, though the effect of the bandage had been to make the already flattened nose even flatter than before Today, in accordance with Hippocrates's teaching, we do not bandage noses, but, as recommended by him, we introduce "something" into the nostrils to rectify the parts He emphasized the need for immediate reduction of displacements of the nasal bones owing to the rapidity of callus formation

Hippocrates did not favor "new" treatments unless they could be proved after a thorough trial to be effective In explaining why he thought it necessary to give "longer directions" on the treatment of fractures, he remarked that he knew physicians who had the reputation of being skilled in the treatment of fractures as they adopted new methods As an example he cited the fact that they bandaged the forearm, when fractured, in supination "People rather admire what is new," commented Hippocrates, "although they do not know whether it be proper or not" Further reference to his teaching on fractures of the forearm will be made below

Today, Hippocrates's teaching is of special value to us with regard to diagnosis and prognosis rather than treatment, with the notable exceptions of the matter of diet and the reduction of fractures and dislocations But he also helps us in our attitude toward our patients Since B C 400, medicine has changed—it has progressed—but patients have remained much the same How familiar we are with the patients to whom he alludes who "live in the same way when sick as when in health, take what suits their appetite, and neither restrain nor restrict themselves in anything for which they have a desire" He emphasized the great importance of securing the patient's cooperation, without which, however good the physician, the desired result cannot be obtained

In an aphorism he told us how the diet must be made to suit the patient In another upon diet, which we should heed, he stated "Old persons endure fasting most easily, next, adults, young persons not nearly so well, and most especially infants, and of them such as are of particularly lively spirit"

He also pointed out that harm might result from too sparse just as easily as from too liberal a diet, and that the constituents of a sparse diet should be more varied and carefully selected

Diet was considered of the utmost importance in medicine, for he remarked, "There would be no need for the art of medicine if all men when sick could eat the same food and drink which they ate and drank when in good health"

Hippocrates attached great importance to the making of a correct prognosis, for though many diseases could not be cured, the physician should be able to tell which patients would get well and which would die Fever, he explained, was in itself not a disease but a symptom, and not necessarily serious He described what has now come to be known as the Hippocratic facies, and this is still of very great value to us in prognosis If this facies could be attributed to loss of sleep, diarrhea, or want of food, he considered that the danger was not so serious, but if, with *treatment directed toward the alleviation* of these causes, no improvement took place, it was known for certain that death was at hand

The posture of the patient was also studied, and his careful description of the various postures and their prognostic significance should receive the attention of every medical student The features of *subsultus tendinum*, still regarded as a sign of extreme toxemia, were described with graphic accuracy and regarded by him as "bad and deadly"

His observations on the patient's respirations, sweat [illegible] mnia, looseness of the bowels, vomit and sputum with reference to their prognostic importance are of the greatest value. The gravity of black vomit was appreciated and regarded, as it was only some twenty years ago, as a herald of impending death. Now happily we have gastric suction, which saves many patients who without it would die.

The rusty sputum of pneumonia was considered a favorable sign if coughed up at the commencement of the disease, but less so if it continued to the seventh day or later. Black sputum was considered very dangerous. The prognostic significance of the various symptoms and signs of empyema were carefully assessed—far more so than they usually are today, as we have the benefit of bacteriologic and roentgen examination.

With regard to the treatment of medical conditions, some of Hippocrates' simple remedies are still employed, and his detailed dissertations on diet should perhaps receive greater attention than they now do. Hot applications of various kinds were used. Venesection was advocated for pain extending up as far as the clavicle and for acute affections if the disease appeared "strong," if the patient was "in the vigor of life" and if he was strong. For pleurisy, besides bleeding he gave a confection purgative for the robust but an enema for weaker patients.

Thus much of our symptomatic medical treatment is based on Hippocrates, or is at least very similar to his. The same applies to some of our surgical treatments, of which massage, exercises and bandaging are examples. The large arm sling for elevating the forearm and hand after fractures and other injuries was used extensively by Hippocrates. Compression was regarded by him as important, for he alluded to it several times in his works and to the ways in which it could be obtained without ill effects. Compression should, he emphasized, be obtained by the number of bandages rather than by the force of constriction. He taught how varus and valgus deformaties of the foot could be corrected by bandaging.

Hippocrates warned against the development of bed sores in patients "carelessly allowed to remain in a certain position during confinement to bed." This, he said, might take place "when in any disease a protracted decubitus takes place." He stated that the sores are inveterate, troublesome, liable frequently to break out again, and apt to be attended by very acute fevers of the continual type.

Of individual conditions, Hippocrates was particularly interested in fractures, dislocations and head injuries. In these he laid much of the foundation of our knowledge, and some of his methods of treatment are still followed in principle if not in detail. He also provided information, still of great value, on empyema, otitis media, diphtheria, Pott's disease of the spine, deformities, and epilepsy, as well as other diseases.

In the treatment of fractures, Hippocrates thought out the best positions in which a limb should be immobilized. He it was who formulated the general rule that the forearm should be put up at a right angle to the upper arm, as it could not be kept long in extension, but he added, "We must look to the part in the state of rest, in its middle state, and to habit." By habit he probably meant that the forearm should be in the position in which the patient could most easily keep it, i.e., in a large arm sling at a right angle. He also postulated that the knee should be immobilized in extension, as it was habitually extended in standing and walking.

In the treatment of fractures of the long bones, Hippocrates paid attention to the three general principles which we observe: reduction, immobilization and restoration of function. As the bones of the ancient Greeks united more quickly than ours do today, there was probably less difficulty in restoring function unless the fracture was badly reduced. Hippocrates stated the usual times for which it was necessary to immobilize fractures, viz: radius and ulna, thirty days; humerus, forty days; bones of the forefoot, twenty days; calcaneus, sixty days; Pott's fracture, forty days; femur, fifty days; bones of the nose, ten days, and ribs, twenty days.

Reduction in his day, as now, was largely obtained by extension. His methods of traction for reducing a fracture of the thigh must have been very effective, for he thought that the extremities of the fragments were sometimes actually pulled apart and mentioned that "it is a great disgrace and an injury to exhibit a shortened thigh." But he, like us, *did not always find it easy to obtain* sufficient extension on the femur, for he referred to the fact that "particular pains should be taken in regard to the extension, that it may not be insufficient."

"When sufficiently extended," he explained, "it will be easy to adjust the bones and bring them into their natural position by straightening them and arranging them with the palms of the hands."

Immobilization was secured by very careful bandaging. The bandages were wound moderately tightly, and one gathers that Hippocrates did not have a *case of* ischemic contracture, or, if so, did not consider that it was caused by tight bandaging—a view which many surgeons of today would endorse—for he stated that the bandage should be applied tightly enough so that for the first day and night the patient fancied that the tightness *did not diminish but rather increased*; and if on the next day there was *a soft swelling* in the hand, this was regarded as a favorable sign; but he warned against too tight bandaging, and he stipulated that on the third day the bandage should appear loose.

No plaster of paris was used, but the limb was smeared thinly with cerate—a mixture of wax, oil, lard and other substances—to encourage the bandage to stick. The bandages were applied as we apply them while reduction was being *maintained* by manual or *mechanical* means. Splints, which he stated should be padded, were not applied until the seventh to the eleventh day, as during the intervening period improvement in the position of the fragments was aimed at.

For each individual fracture he gave explicit instructions as to how the fracture should be reduced, and his remarks regarding the treatment of fractures of both bones of the forearm are of special interest. As some of us realize from our own (sometimes bitter) experience, these fractures are not always easy to reduce and hold reduced. Within our own lifetime some authorities have advocated that these fractures should all be put up *with the forearm in supination*. Yet Hippocrates realized, as most of us do today, that most fractures of the forearm if put up in supination do not do well. On first reading his description one may get the impression that he favors the position of pronation, but on a more careful perusal it becomes clear that he really advocates the position midway between pronation and supination, which we now use for fractures below the insertion of the pronator teres, i.e., *for the majority of* fractures of the forearm—excluding fractures of the Colles type to which he does not specially refer. It is true that he did not single out fractures below the insertion of the pronator teres for this treatment, but the consequences of not adopting supination for fractures above the pronator insertion are less serious than those of adopting this position for fractures below it. The latter course results *in permanent deformity, with an upturned* palm and considerable impairment of function.

Fractures of the calcaneus were in Hippocrates' day apparently even more serious than they are now, being occasionally complicated by gangrene. For these fractures he advocated confinement to bed, elevation of the part, and moderately firm bandaging with the use of many bandages, the bandages being reapplied on the third day. During the last thirty years we have tried to improve on this method of treatment, *but many surgeons will agree that* we cannot yet be sure that we have made much, if any, improvement, except for slight alterations in the details of the technic.

He described several devices for obtaining extension in order to reduce a fracture of the lower leg, some just as ingenious as our modern orthopedic tables and screw-traction appliances. These he considered necessary, as, although the principle of applying extension was the same as for fractures of the forearm, greater force was (as we know full well) required, for, as he aptly put it, "the parts of the body concerned are stronger in this case."

Countertraction was obtained by taking a round, smooth piece of wood which was fastened deeply into the ground, the upper extremity of the piece of wood being used as a perineal strut, so that it prevented the body from "yielding to the pulling at the foot." The foot was then padded and secured with thongs of ox skin, the ends of which were secured to a pestle or other piece of wood which was inserted into the nave of a wheel, thus firmly anchoring it. The wheel was then pulled upon in the long axis of the limb to obtain extension.

The principle of this procedure is not so very unlike that employed today for the reduction of fractures of some of the long bones, and our modern methods are almost certainly based on those of Hippocrates, who had to make do with such appliances as he could get. Even the detail of having an assistant seated at the patient's side to "push back the hip so that the body may not turn round with the pulling" was mentioned by him.

Today we make use of screw-traction, and Hippocrates did in fact make use of it too, not quite by the same method as we generally do, but by means of a windlass. Regarding apparatus for reducing fractures, he advised that any physician practicing in a large city should have prepared a proper wooden machine with all the mechanical powers applicable in cases of fractures and dislocations.

Hippocrates's description of how to reduce a fracture-dislocation of the ankle joint reads almost like that of a modern text book:

"When you have made proper extension, it is easy to reduce the joint, for the displaced bone is then raised into line with the other. And the bones are to be adjusted with the palms of the hands, pressing upon the projecting bone with the one and making counter-pressure below the ankle with the other. When you have replaced the bones, you must apply the bandages while the parts are upon the stretch, if you possibly can; but if prevented by the thongs, you must loose them, and then make counterextension until you get the bandages applied." Today, happily, we have the Steinman pin to help us, so that there is no difficulty in applying our plaster bandages "while the parts are on the stretch," but some of us occasionally have patients who refuse the insertion of the pin, and then we, like Hippocrates, have to "loose" the thongs—our clove hitch round the ankle is probably not so very unlike his—and "make counterextension" until we get the bandages applied.

Fractures of the clavicle were discussed in detail. He stated that they caused no harm to the shoulder or the rest of the body and that union speedily occurred. The sternal fragment most often became displaced upward and the acromial fragment, which he regarded as the more mobile, downward. The acromial fragment ought, he argued, to be elevated by pushing the arm when at the side as much as possible upward. But in certain cases, he said, "the elbow is to be brought forward to the breast and the hand laid on the acromion of the sound side." This is the principle embodied in Sayre's method, which is still used today.

For fractures of the mandible, though Hippocrates did not wire the upper jaw to the lower as we do today by our islet method, he certainly used wire in the form of gold thread for securing distorted and loosened teeth and with the object of "keeping the parts at rest."

In his remarks upon fractures of the spine there are some significant sentences. "Displacements from a fall rarely admit of being rectified. . . Excurvation in adults speedily relieves the individual from the disease he is suffering under, but in time it renews its attack" In other words, if you reduce a fracture of the spine, the displacement will recur One of the latest methods advocated for the treatment of fractured spine is to employ functional treatment only, without attempting reduction at all By this means better results are claimed than by hyperextension treatment, for, as Hippocrates (and our recent authority) stated, even if you reduce a fracture of the spine, it "renews its attack"

Dislocations, like fractures, were dealt with at length He explained that people varied much in the ease with which their dislocations could be reduced They were less frequent in fat people, but when they occurred were more difficult to reduce The reverse applied to thin people The shoulder and knee joints were most subject to dislocation in Hippocrates's day

The symptoms and signs of dislocation of the shoulder joint were described graphically Particular attention was directed to the value of comparing the sound *with the injured side, but he warned that* this may be deceptive except for one experienced in making such comparisons, "for many persons, from pain, or from any other cause, when their joints are not dislocated cannot put the parts in the same positions as the sound body can be put into"

The heel in axilla method of reducing dislocations of the shoulder joint for which Hippocrates's name is particularly famous was one of six methods described by him, and not, according to him, the strongest of all the methods of reduction We do not now carry out his method exactly in the manner he described Hippocrates said that a round ball of suitable size should be placed in the hollow of the armpit, for without something of this *kind the heel could not reach the head of* the humerus A supple piece of broad thong was placed round the ball and the ends held by an assistant seated above the patient's head, who depressed the shoulder with his foot while the operator reduced the dislocation by traction on the arm with his heel in the axilla

His information regarding dislocations of the hip joint is valuable, particularly that of anterior (inward) dislocations which we now seldom see, but which in his day were the commonest variety The anterior dislocation was, according to him, more serious than the posterior (outward), especially when left unreduced The clinical signs of both varieties were given in detail Congenital dislocation of the hip joint both unilateral and bilateral, was also accurately described

Hippocrates had an effective treatment for congenital clubfoot and maintained that this deformity should be treated at as early a period as possible, 'before the deficiency of the bones in the foot is very great, and before there is any great wasting of the flesh of the leg" The treatment consisted in "modeling the foot like a piece of wax, applying resinous cerate and numerous bandages," or "a piece of lead" was bound on—in other words, a splint Our present treatment is not very different

On injuries of the head, Hippocrates's teaching is of the greatest value He classified fractures of the skull, and, though his classification was different from our present day classification, he realized and taught some points which were and still are of vital importance

He distinguished between a fissured and a depressed fracture He realized that a fracture of the skull might occur not at the point struck but at some other point distant from this He realized in his examination of the injured head that one must *"ascertain respecting the hairs* about the wound, whether they have been cut off by the instrument and have gone into the wound" How many skulls one opens today for the purpose of preventing infection of an open fracture and discovers beneath an indriven fragment of hair "cut off by the instrument," as Hippocrates so well described it!

He stressed the importance of a visual examination of the wound, by which means one can learn almost as much as by palpating it He realized the difficulty in diagnosis when the head over a suture, owing to the roughness of the bone in this situation. He stated that many fractures at sutures require trephining but that the trephine must not be applied to the suture itself but to the adjoining bone. He appreciated that depressed fractures were less dangerous if the dura remained intact. He emphatically stressed the importance of avoiding injury to the dura when trephining a skull. All these things are still true today, and very important.

The works of Hippocrates would form a valuable subject at medical schools in the very first year of study. By including this subject and cutting down a little perhaps on the sciences of elementary biology, the medical student would, early in his or her career, be made to understand the real meaning of Hippocrates, and through him of medicine. The student would moreover acquire early a great interest in the art of medicine, a knowledge of many fundamental and important facts, and a proper grasp of the meaning of the oath of Hippocrates upon which medical ethics are based, for Hippocrates was perhaps, above all else, a wonderful propagandist for all that is honorable and genuine in the practice of medicine.

The Sixteenth Annual Assembly
of the United States Chapter
International College of Surgeons

will be held at the Palmer House in Chicago
September 10-14, 1951

For details, write
Dr. Arnold S. Jackson, *Secretary*
United States Chapter, International College of Surgeons
1516 Lake Shore Drive, Chicago 10, Illinois

Chapter News

International College of Surgeons

United States Chapter

Arnold S Jackson MD FACS FICS Secretary

New York Surgical Section The First Annual Assembly of the New York Surgical Section, initiated by Dr Horace E Ayers, Regent for the state of New York, was a memorable and stimulating occasion Dr Ayers was well repaid for his efforts in the unbounded enthusiasm evinced by all concerned Among the prominent participants were the following

Dr Herbert Acuff, President, International College of Surgeons

Dr Henry Meyerding, President, United States Chapter

Dr Max Thorek, Founder and Secretary General

Dr Carlton Weitz, President, New York State Medical Society

Dr J Stanley Kenney, President-Elect, *New York State Medical Society*

Dr Louis H Bauer, Chairman of the Board of Trustees, American Medical Association

Dr Marcus D Kogel Commissioner of Hospitals, New York City

Mr Harrision Cleveland, *Delegate from* the Consul General of Canada

Dr Walter P Anderton, Executive Secretary, New York State Medical Society

Dr Henry M Scheer, Chairman, New York Surgical Section, United States Chapter, International College of Surgeons

Dr Oswald S Lowsley, Chairman, Foreign Relations Committee, New York Surgical Section

Dr Henry Kessler, Medical Director of the *New Jersey* Rehabilitation Clinic

The climax of the occasion was reached at a dinner held in the Grand Ballroom at the Hotel McAlpin on the evening of Wednesday, March 14 After the invocation, pronounced by the Rev Dr Roelif H Brooks, the program was introduced by Dr Ayers, with Dr Henry Kessler as toastmaster The speakers of the evening were Dr Acuff, Dr Meyerding and Dr Thorek Guests of honor included Dr Anderton, Dr Bauer, Dr Kenney, Dr Kogel, Dr Weitz, Dr Edward *Bernecker and Dr Gabriel Porto of Brazil*

The organization of the Section marks an important forward move in Chapter activities The following officers and committee heads have been installed

Regent Dr Horace E Ayers

Vice-Regents Dr Chester Peake, Dr John J Rainey and Dr Francis R Daniels

Chairman Dr Henry M Scheer

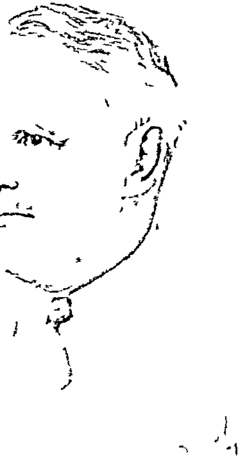
Vice Chairmen Dr Edwin A Griffin and Dr Joseph D Hallinan

Secretary-Treasurer Dr Joseph F Rooney

Scientific Committee Dr Paluel Flagg, Chairman, Dr Bernard J Ficarra, Vice-Chairman

Foreign Relations Committee Dr Oswald Lowsley, Chairman, Dr Roy Upham, Vice-Chairman

Entertainment Committee Dr Sidney Weston, Chairman, Dr Morris Weintraub,



Dr Horace E Ayers

Vice-Chairman

Membership Committee: Dr. Joseph Hass, Chairman; Dr. John Sauer, Vice-Chairman

Ladies' Auxiliary: Mrs. John Goller, Chairman; Mrs. John Mussio, Vice-Chairman

The *Journal* congratulates Dr. Ayers and the New York Surgical Section on the splendid success of its initial assembly.

Essay Prize Winner Announced: The prize in the recent *Journal* competition for the best essay on "The Meaning of Hippocrates in the Medical World Today" has been awarded to Mr. S. V. Humphries of London and South Africa. The prize, a $100 Government bond, has been forwarded to Mr. Humphries with the Journal's congratulations, and the winning essay appears in full as an editorial in this issue.

Recent Honors: Two Honorary Fellows of the International College of Surgeons, Dr. Elmer L. Henderson and Dr. George F. Lull, have been awarded the Carlos J. Finlay medal and scroll in Havana, Cuba, for distinguished service in the field of medicine and public health. The Finlay award is the highest medical honor in Cuba's gift.

Dr. Henderson is President of both the American Medical Association and the World Medical Association. Dr. Lull is Secretary and General Manager of the American Medical Association.

Dr. Lowsley Honored: Dr. Oswald S. Lowsley has just returned from a six weeks' lecture tour of Venezuela, Colombia, Panama and Central American countries. He gave operatic clinics and held conferences in each of the countries visited and made arrangements for many young doctors to come to the Oswald Swinney Lowsley Foundation Inc., of St. Clare's Hospital, for instruction in urologic diagnosis and surgery.

Dr. Lowsley found the attitude of the doctors much more pro-American than ever before. Many of his former students are holding key positions in their respective countries.

Appointment: Dr. Domenico Cappetta, F.I.C.S., has been appointed recently to the post of Assistant Professor of Clinical Ophthalmology at the Post-Graduate Medical School, New York University.

Israeli Chapter: The Israeli Chapter of the International College of Surgeons was organized at a meeting held in Jerusalem on Feb. 28, 1951. The following officers were elected:

President: Dr. Georg Wolfsohn, F.I.C.S., Chief, Surgical Department, Bicur Cholim Hospital, Jerusalem

Vice-President: Dr. Daniel Fritz Peyser, F.I.C.S., Director, Department of Surgery, Rothschild Hospital, Haifa

Secretary: Dr. Ernst Lehmann, F.I.C.S., Director, Urological Department, Sharon Hospital, Petach-Tiqvah

Treasurer: Dr. Ernest Wodak, F.I.C.S., Director, Otorhinolaryngological Department, Hadassah Hospital, Tel-Aviv

Dr. Neumann of Jerusalem, an officer of the Ministry of Health, was elected an Honorary Fellow of the Israeli Chapter.

Brazilian Chapter: The First Assembly of the Brazilian Chapter of the International College of Surgeons will be held in São Paulo on September 27th through the 30th, under the auspices of the Brazilian Chapter and the Government of the State of São Paulo.

The theme of the Assembly will be "Minimal Standards for Hospital Organization in Brazil."

A scientific program will be presented and each essayist will be allowed ten minutes for his presentation.

Complete details may be obtained by contacting the President of the Chapter, Prof. Dr. Carlos Gama, Rua Bahia 499, São Paulo, Brazil, or the International Secretariat, 1516 Lake Shore Drive, Chicago 10, Illinois.

Correction: In the article "Carcinoma of the Cervical Stump" by Drs. Dexter H. Witte and David W. Ovitt, appearing in the March issue of the *Journal,* a typographical error occurs in line 17, page 314. The word "not" was erroneously inserted. The line should read ". . . operation would have to be justified", etc.

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General News Notes

German Surgical Society: The sixty-eighth meeting of the Deutsche Gesellschaft *für Chirurgie (German Surgical Society)* was held in Munich on March 28 to 31 inclusive. A highly significant program had been prepared and was excellently presented by some of Germany's foremost surgeons. Dr. Rehn of Freiburg discussed "The Prophylaxis and Treatment of Thrombosis and Embolism. Drs. Bodechtel of Dusseldorf and Vozschulte of Munich collaborated on a paper entitled "The Pathogenesis and Treatment of Chronic Painful Conditions." Drs. Hoff of Aschen and Brunner of Zurich followed with "The Pathogenesis and Treatment of Hypertension." "Treatment of Old and Recent Lesions of the Brain" was presented by Drs. Tonnis of Langendreer and Wanke of Kiel. The fifth presentation was a dual one; Dr. Boshamer of Wuppertal-Barmen discussed "Chemotherapy for Urogenital Tuberculosis" and was followed by Dr. Borminghaus of Dusseldorf on "Indications and Technic for Extirpation of the Bladder." The program closed with a paper by Dr. Hellner of Gottingen on "Sarcoma of Bone and Its Treatment."

Physicians' Art Show at A.M.A. Meeting: The American Physicians Art Association will have an art exhibit, as usual, during the A.M.A. convention at Atlantic City, N. J. June 11 to 15, 1951, inclusive. Any *physician in the United States*, Canada and Hawaii desiring to participate in this show should communicate with the secretary for particulars.

J. Henry Helser & Co., Inc., Investment Managers with offices on the Pacific Coast, are the new sponsors of the American Physicians Art Association and will award 200 trophies besides a special Helser Trophy —a large decorative cup depicting Yankee Ingenuity. This cup is to be awarded for art work done in any medium. Also the large Popularity Trophy will be awarded to the owner of the art piece receiving the most popular votes during the A.M.A. convention. Over 4,000 members of the American Physicians Art Association will shortly receive *entry blanks, shipping labels and rules about* this fourteenth art exhibition.

The Annual Art Banquet will be held Tuesday evening, June 12 at the Marlborough-Blenheim Hotel, Atlantic City, N. J. Communications should be addressed to F. H. Redewill, M.D., *Secretary, American* Physicians Art Association, 760 Market Street, San Francisco 2, California.

Congress on Tuberculosis and Diseases of the Chest: To stimulate discussion in Great Britain on these topics a Congress will convene in Oxford from July 16 to 21. The conference is sponsored by the Faculty of Radiologists, the Society of Thoracic Surgeons, the Tuberculosis Society of Scotland, the Society of Medical Officers of Health, the British Pediatric Association, and the British Tuberculosis Association. The Honorable *Secretary is Dr. Stephen Hall*, 16, Grosvenor Place, London, S.W.1.

***The Association of Surgeons of Great* Britain and Ireland:** Manchester has been selected for the annual meeting of the Association, to be held on July 19, 20 and 21, 1951. The program includes a discussion of head injuries, infections of the hand, carcinoma of the colon, acute pancreatitis, and after-history of the amputee in peripheral vascular disease.

International Jubilee Assembly: The French Society of Gynecologists, under the auspices of the President of the Republic and the Presidency of Honor of the Ministers of Public Health, Foreign Relations and National Education, will assemble in Paris, June 23 to the 29, 1951. Arrangements for *this International Congress, organized in* collaboration with UNESCO, are under way.

The meetings will be held at the Centre Marcellin-Berthelot (Maison de la chimie, 28 bis Rue St. Dominique), where soundproof study rooms and a projection room will be set up. A first-rate exhibition comprising several sections, such as drugs, surgical and electroradiologic instruments, is also being organized. An exhibition of ancient documents treating of gynecology will be held under the auspices of *Professor* Laignel-Lavastine. Reception rooms will be assigned where the Congressmen and their *families will* be greeted. Lastly, a bar, a restaurant and a special telephone service will accommodate the members. Titular members of the Congress will receive two richly bound volumes, the Jubilee Book of the French Society of Gynecology and a volume containing all the lectures of the Congress. These publications will not be available on the market. Numerous receptions and amusements will be provided as well as an opportunity to attend the festivities of the second millenium of Paris.

All requests for information or the details of registration should be addressed to Dr. Maurice Fabre, Secretaire General, 1 rue Jules Lefebvre, Paris (IXe.), telephone Trinite 44-88.

Medical Seminar at Mount Sinai Hospital, Florida: Physicians and surgeons throughout this country and Cuba are being invited to attend the First Annual Medical Seminar of Mount Sinai Hospital, Miami Beach, Florida. The event will be held on May 23, 24 and 25, 1951, at the Sorrento Hotel.

Sponsored by the medical staff of Mount Sinai Hospital, the seminar will provide another link in the comprehensive educational research program established at the hospital, which, although only fourteen months old, has already been fully approved by the American College of Surgeons and recently was approved for intern training by the American Medical Association.

Outstanding medical and surgical specialists throughout the country in the cardiovascular field have been invited to participate in the seminar. Under discussion will be various forms of heart diseases and peripheral vascular diseases from the medical, surgical, physiologic and pathologic points of view. Recent work on cholesterol metabolism also will be reviewed.

Guest speakers at the seminar will include:

Dr. David I. Abramson, Chief, Peripheral Circulatory Clinic, Michael Reese Hospital, Chicago: *Physiology and Physio-Pathology of Peripheral Vessels;* also, *Functional Vascular Diseases.*

Dr. Claude S. Beck, Professor of Neurosurgery, Western Reserve University School of Medicine, Cleveland: *Operation for Coronary Artery Disease.*

Dr. Samuel Bellet, Associate Professor of Cardiology, Graduate School of Medicine, University of Pennsylvania, Philadelphia: *The Effect of Electrolyte Alerations on the Heart with Particular Reference to the Effect of Hyper and Hypotassemia;* also, *Treatment of Cardiac Arrhythmias with Particular Reference to the Use of Recent Therapeutic Agents.*

Dr. John W. Gofman, Associate Professor of Medical Physics, Donner Laboratory, University of California, Berkeley: *Biophysical Methodology and Its Application to Medical Research;* also, *Studies of Arteriosclerosis Utilizing Biophysical Approaches.*

Dr. Seymour S. Kety, Professor of Clinical Physiology, Graduate School of Medecine, University of Pennsylvania, Philadelphia: *The Circulation and Metabolism of the Human Brain in Health and Disease.*

Dr. Charles W. Robertson, Associate Visiting Surgeon, Massachusetts Memorial Hospitals, Boston: *Peripheral Vascular Disorders: Methods of Study;* also, *Peripheral Vascular Disorders: Methods of Treatment.*

Dr. Otto Saphir, Director of Pathology, Michael Reese Hospital, Chicago: *Pathology of Arteriosclerosis;* also, *Collagen Alterations in Rheumatic Heart Disease.*

In addition to the lectures, a cocktail party and banquet will be held on May 23. Complete recreational facilities, including golfing, swimming, fishing and sightseeing parties, are being provided for the wives of visiting physicians. Similar activities can also be arranged for physicians who desire these recreations.

Further information on the three-day meeting may be obtained by writing to the Chairman, Seminar Committee, Mount Sinai Hospital, 4300 Alton Road, Miami Beach, Florida.

Registrations for the seminar will be limited to 200 physicians. The fee is $20 for practicing physicians and $7 for interns and residents. These fees include the cocktail party and banquet.

International Congress of Physical Medicine: This Congress, organized by the British Board of Management of the International Federation of Physical Medicine, will be held in London from July 14 to 19, 1952. In accordance with the regulations of the International Federation of Physical Medicine, the meetings of the Congress will be reserved for matters dealing with the clinical, remedial, prophylactic and educational aspects of physical medicine and with the diagnostic and therapeutic methods employed in physical medicine and rehabilitation.

Technical, scientific and historical exhibitions also will be arranged.

In addition to the scientific program, a full program of social events and entertainment is being planned for the members and associate members Arrangements for London and provincial visits of scientific and historical interest are also being made for the Congress week and the following week

This is a preliminary notice Full details will be notified later Applications for the Provisional Programme should be addressed to the Honorary Secretary, Dr A C Boyle, International Congress of Physical Medicine (1952) 45, Lincoln's Inn Fields, London, W C 2

Cuban Officers Elected: The Cuban National Society of Surgery has elected the following officers

President—Dr Manuel Costales Latatu
Vice President—Dr Antonio Rodriguez Diaz
Secretary—Dr Pedro Sanchez Toledo
Assistant Secretary—Dr Louis Rodriguez Baz
Treasurer—Dr Julio Ortiz Perez
Assistant Treasurer—Dr Tomas Armstrong

Peruvian Assembly: The Fifth Peruvian Assembly of Surgeons was held, under the auspices of the Supreme Government of Peru, in Arequipa from March 25 to 29, 1951 A meeting of a chapter of the same organization was also held at Cusco on March 30 and 31 Both were highly successful The following program was presented

First Theme *Cesarean Operations*
Speakers Dr Gerardo Lozada of Lima, Dr Alberto Sanchez Moreno of Arequipa

Second Theme *Acute Cholecystitis*
Speakers Dr Hernan Bello of Lima, Dr Guillermo Ballon Landa of Arequipa

Third Theme *Exposed Fractures*
Speakers Dr Eduardo Bermudez of Lima, Dr Jorge Jaruffe of Arequipa

Swiss Society of Internal Medicine. The nineteenth annual meeting of the Swiss Society of Internal Medicine will convene June 1 to 3 at Chur The pathology and treatment of nephritis and the treatment of hypertension constitute the items of particular interest on the program Those interested may communicate with Prof Eric Martin, Policlinique Medicale Universitaire, Avenue du Mail 2, Geneva

Registry of Hepatic Pathology The American Gastroenterological Society has sponsored a registry of hepatic pathology, to be administered under the auspices of the National Research Council Liver specimens obtained by biopsy or autopsy and accompanied with laboratory and clinical records will be collected and made available for research The Armed Forces Institute of Pathology will review the material and give an opinion of it to the contributor Forms obtainable from the Institute must accompany the material, and specimens should be *sent to the Director, Armed Forces Institute* of Pathology, Registry of Hepatic Pathology, Washington 25, D C

Congress of Military Medicine: The Thirteenth International Congress of Military Medicine and Pharmacy is scheduled to be held in Paris from June 17 to 23 1951 An *interesting program is in the making* Those interested should communicate with the Secretary General of the organization

British Congress of Obstetrics and Gynecology. This congress will be held at Leeds from July 8 to 11, 1952 The program includes discussion of the following subjects *abnormal uterine action in labor*, stress incontinence of urine, the place of the pediatrician in a maternity unit, and genital tuberculosis in the female Those interested should communicate with the Secretary General of the congress, 32 Park Square, Leeds, 1

International Hospital Congress. The seventh International Hospital Congress, under the auspices of the International Hospital Federation, will convene in Brussels, Belgium, from July 15 to July 21, under the chairmanship of Dr Rene Sand Care of the Chronic Sick *and the Aged"* will constitute the central theme of the meeting

The International Congress of Pathology. This Congress will meet in London July 16 to 20, 1951 A preliminary brochure will be sent to the members of the American Society of Pathologists and other interested persons An extremely *informative program* is in the making

Psychosurgery in the Treatment of Mental Disorders and Intractable Pain. By Walter Freeman and James W. Watts. Springfield, Ill.: Charles C. Thomas, Publisher, 1950. 2d ed. Pp. 638, with 187 illustrations.

The second edition of this remarkable work marks a decided advance over the first, which is saying a great deal. The first edition was based on a study of approximately 80 patients; the new edition covers the cases of a thousand or more.

The operation chiefly emphasized is prefrontal lobotomy. In preparing the second edition the authors had the double advantage of being able to present not only a great deal of new data on patients treated since the publication of the first edition but a great many pertinent facts as to follow-up on the patients in the original series.

The book begins with a concise survey of the history of surgical treatment for mental conditions and intractable pain. A careful anatomic orientation is provided, as are chapters on preoperative and postoperative management. The choice of operation for any particular case is discussed in some detail.

The high points of interest throughout, however, are provided by the rich abundance of case studies accompanied by photographs of the patients at various stages of progress. Long actual conversations are reported verbatim, some of them having taken place between surgeon and patients while the operation was actually going on. The use of local anesthesia has made possible the taking of notes of inestimable value concerning the patient's sensations, emotions and reactions.

No exorbitant claims are made. The authors omit nothing in their outspoken account of the difficulties for both the patient and his family during the rehabilitation period following the operation. An admirable and respectworthy account of what is still a comparatively new procedure, the book has the additional merit of being extremely readable and well presented.

You and Heredity. By Amram Scheinfeld. Philadelphia: J. B. Lippincott Company, 1950. Pp. 612. Illustrated by the author.

Announced as "an outstanding book on heredity for laymen", this compact volume lives up to its purpose so far as simplicity and lucidity are concerned; yet there is much in these pages to interest the professional reader. All the main points of heredity, both accepted and controversial, are discussed. The distinction between hereditary disease and congenital disease is made plain. Disease, however, makes up but a modicum of the subject matter. Physical characteristics and peculiarities are dealt with in detail, as are multiple births, anomalies, pigmentation, etc. The phenomenon of the identical Dionne quintuplets is analyzed from the genetic point of view. Life expectancy as influenced by hereditary factors is explained.

On the psychic side, the author explores talent and genius, as well as the mentally retarded, in relation to chromosomes. Child prodigies are shown to be of several widely varying types: the hothouse or forced variety, the "flash in the pan" and the genuine persistent genius type. Sexual aberrations and abnormalities are not neglected.

The author has illustrated his book with excellent charts, photographs and line drawings. Some of the charts as well as several photographs are in full color.

La Stérilité Involontaire: Evaluation des Méthodes de Diagnostic et de Traitment. By Raoul Palmer, with the collaboration of Elisabeth Palmer. Paris: Masson et Cie, 1950. Pp. 494, with 88 illustrations.

The problem of involuntary sterility is important from the individual and the social standpoint. A rational treatment must be based upon an exact and complete diagnosis. The author has studied this question for many years. He is convinced that in the majority of cases infertility results from several associated factors. For the successful treatment of this condition all the etiologic factors, main and accessory, should be recognized and corrected.

Normal fertility calls for the integrity of all of a series of physiologic mechanisms: spermatogenesis, sperm emission, ascension of the spermatozoa into the female genital pathways, ovogenesis, ovulation, reception of the ovum by the fimbriae of the fallopian tube; fertilization and segmentation of the fecundated ovum; tubal migration of the ovum; nidation of the ovum in the uterine cavity, and maintenance of the corpus luteum.

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All the aforementioned factors are scientifically analyzed and discussed.

Both mates must be subjected to tests to determine whether the aforementioned processes are correctly functioning at the appropriate time.

The first part of the work is devoted to a discussion of diagnostic methods and the tests to be employed. The second part is devoted to treatment of the etiologic factors. For each of the causative factors the treatment and prognosis is stated.

The book is a valuable addition to professional knowledge. It is based chiefly on the clinical experience of the author. It is a book to be recommended.

Encyclopedia of the Eye: Diagnosis and Treatment. By Conrad Berens and Edward Siegel. Philadelphia: J. B. Lippincott Company, 1950. Pp. 272, with 76 illustrations, 42 in color.

An encyclopedic source of reference on the diagnosis and treatment of ocular diseases, alphabetically arranged and implemented by a comprehensive index, is here presented. Almost every aspect of the subject is included. The fine illustrations, particularly those in color, furnish an additional advantage to the student or reader. Nurses and social workers, as well as those directly responsible for diagnosis and therapy, will find in this work a valuable informative aid.

Surgery of Cataract. By Daniel B. Kirby. Philadelphia: J. B. Lippincott Company, 1950. Pp. 695, with 339 illustrations, including 52 subjects on 21 color plates.

Here is a comprehensive monograph on the nature and therapy of cataract by a recognized authority in the field, superbly illustrated and clearly written. For so highly specialized a work it is focused to a remarkable extent on the concept of the patient as a whole, which is becoming more and more widely recognized as a *sine qua non* of successful practice.

Dr. Kirby is a scholar and writes like one. The book is supplied with a rich background of historical and literary allusion that speaks of wide and attentive reading and research on the humanitarian as well as on the scientific side. The text that follows is completely modern in both approach and follow-up. There are five principal divisions: *The Development of Cataract Surgery, Preparation for Cataract Surgery, Present-Day Cataract Surgery, The Correction of Aphakia,* and *Results Obtained in Cataract Surgery.*" "I have chosen," says the author, "the items which have been most helpful to me in a practical way in the achievement of the purpose of cataract surgery, namely, the restoration of vision to the patient." Liberal quotations from other authors are included throughout, and the author's own technics are presented in meticulous detail.

The color plates are admirable, as good color plates always are, for clarification of the delicate problems involved in ophthalmic surgery. The drawings and halftone illustrations are equally good of their kind. This is, in short, a decidedly valuable book and should be welcomed by specialists in the field.

Functional Anatomy of the Limbs and Back. By W. Henry Hollinshead. Philadelphia: W. B. Saunders Company, 1951.

This book emphasizes the statement that it is impossible to discuss function without discussing the morphologic basis underlying that function. It is impossible to limit a work of this type strictly to the limbs and back. Hence, other parts of the body have correctly and of necessity been included.

The book is elementary in that it is primarily written for the student with little or no formal training in human anatomy. Correctly, confusing synonyms have been reduced to a minimum.

In the main the pen and ink drawings have been kept simple and are quite illustrative. The superimposition of arrows upon given muscles to depict the direction in which the muscular fibers contract do much to clarify muscular action.

The section dealing with the hand, although quite abbreviated, is especially well done.

The book is well and clearly written and nicely printed. It can be recommended as an excellent introduction to students whose background in pathology and anatomy is not great, and can further be recommended as a reference book to those who have had some training in the aforementioned subjects.

Terapia Chirurgica dei Tumori Maligni della Vescica. By Giorgio Nicolich. Genoa: Artigiani Grafici, 1950. 65 illustrations.

The author presents an excellent book on malignant tumors of the urinary bladder, amply illustrated with roentgenograms and

Psychosurgery in the Treatment of Mental Disorders and Intractable Pain. By Walter Freeman and James W. Watts. Springfield, Ill.: Charles C. Thomas, Publisher, 1950. 2d ed. Pp. 638, with 187 illustrations.

The second edition of this remarkable work marks a decided advance over the first, which is saying a great deal. The first edition was based on a study of approximately 80 patients; the new edition covers the cases of a thousand or more.

The operation chiefly emphasized is prefrontal lobotomy. In preparing the second edition the authors had the double advantage of being able to present not only a great deal of new data on patients treated since the publication of the first edition but a great many pertinent facts as to follow-up on the patients in the original series.

The book begins with a concise survey of the history of surgical treatment for mental conditions and intractable pain. A careful anatomic orientation is provided, as are chapters on preoperative and postoperative management. The choice of operation for any particular case is discussed in some detail.

The high points of interest throughout, however, are provided by the rich abundance of case studies accompanied by photographs of the patients at various stages of progress. Long actual conversations are reported verbatim, some of them having taken place between surgeon and patients while the operation was actually going on. The use of local anesthesia has made possible the taking of notes of inestimable value concerning the patient's sensations, emotions and reactions.

No exorbitant claims are made. The authors omit nothing in their outspoken account of the difficulties for both the patient and his family during the rehabilitation period following the operation. An admirable and respectworthy account of what is still a comparatively new procedure, the book has the additional merit of being extremely readable and well presented.

You and Heredity. By Amram Scheinfeld. Philadelphia: J. B. Lippincott Company, 1950. Pp. 612. Illustrated by the author.

Announced as "an outstanding book on heredity for laymen", this compact volume lives up to its purpose so far as simplicity and lucidity are concerned; yet there is much in these pages to interest the professional reader. All the main points of heredity, both accepted and controversial, are discussed. The distinction between hereditary disease and congenital disease is made plain. Disease, however, makes up but a modicum of the subject matter. Physical characteristics and peculiarities are dealt with in detail, as are multiple births, anomalies, pigmentation, etc. The phenomenon of the identical Dionne quintuplets is analyzed from the genetic point of view. Life expectancy as influenced by hereditary factors is explained.

On the psychic side, the author explores talent and genius, as well as the mentally retarded, in relation to chromosomes. Child prodigies are shown to be of several widely varying types: the hothouse or forced variety, the "flash in the pan" and the genuine persistent genius type. Sexual aberrations and abnormalities are not neglected.

The author has illustrated his book with excellent charts, photographs and line drawings. Some of the charts as well as several photographs are in full color.

La Stérilité Involontaire: Evaluation des Méthodes de Diagnostic et de Traitment. By Raoul Palmer, with the collaboration of Elisabeth Palmer. Paris: Masson et Cie, 1950. Pp. 494, with 88 illustrations.

The problem of involuntary sterility is important from the individual and the social standpoint. A rational treatment must be based upon an exact and complete diagnosis. The author has studied this question for many years. He is convinced that in the majority of cases infertility results from several associated factors. For the successful treatment of this condition all the etiologic factors, main and accessory, should be recognized and corrected.

Normal fertility calls for the integrity of all of a series of physiologic mechanisms: spermatogenesis, sperm emission, ascension of the spermatozoa into the female genital pathways, ovogenesis, ovulation, reception of the ovum by the fimbriae of t[illegible]pian tube; fertilization and segmen[illegible] fecundated ovum; tubal migra[illegible]um; nidation of the ovum in t[illegible]ity, and maintenance of the corpus

Abstracts from Current Literature

Gynecologic Mortality. Finn, W F Am J Surg 1 755, 1950

The scantiness of the literature on gynecologic mortality is discussed by the author He reported 140 deaths occurring on the gynecologic service of the New York Hospital from September 1932 to December 1948, an incidence of 0 68 per cent Since 17,665 operations were performed, with 75 deaths, the postoperative mortality was 0 42 per cent Autopsies were performed in 77, or 55 per cent, of the cases

Cancer was the immediate or remote cause of death in 104 cases (74 3 per cent) The chief immediate causes of death were infection (24 4 per cent), embolism (19 3 per cent), gynecological cancer (18 6 per cent) and renal failure (17 1 per cent) The leading remote causes of death were cancer of the ovary (31 1 per cent), cancer of the cervix (17 per cent) and cancer of the endometrium (8 6 per cent) Other immediate causes of death were respiratory (9 3 per cent), cardiac (6 4 per cent), shock (2 8 per cent) and nongynecologic cancer (4 3 per cent)

Respiratory deaths are on the decrease, owing to improved anesthesia, chemotherapy and better preoperative and postoperative care With the use of early ambulation and anticoagulants as well as other measures the incidence of fatal emboli has been reduced since 1947 Renal insufficiency was the direct cause of death in 24 cases, 19 of the patients having cancer which caused renal obstruction This brings out the undeniable fact that there should be a closer relation between the urologist and the gynecologist

There were 9 deaths from cardiac disease The patients represent a group of poor surgical risks and as a consequence need adequate medical consultation, evaluation and treatment

In this series 3 patients died from hemorrhagic shock due to intraperitoneal hemorrhage This can be prevented by having and utilizing adequate blood It is realized that treatment of the shock is merely supportive treatment preparatory to ligation of the bleeding vessel The patients who died of nongynecologic cancer died of cancer of the bladder and cancer and lymphosarcoma of the pancreas and lymph nodes It is to be noted from this series that the mortality rates of infection and hemorrhage were not materially reduced or altered but that there were fewer deaths from embolism

The author states that gynecologic mortality will be reduced if *(1) more attention* is paid to a history of bowel disturbances, *(2)* peritonitis is detected when accompanying pelvic masses are present, *(3)* perforation of the bowel with peritonitis and/or retroperitoneal abscesses is suspected after roentgen therapy, *(4)* antimicrobial agents are used *more promptly*, *(5) tubal insufflation is* performed only in the first half of the menstrual cycle, curettage is not performed simultaneously, *(6)* early rising and movement is encouraged, *(7)* the patient with pain in the calf, unexplained fever or an increase in the sedimentation rate is treated prophylactically as though thrombophlebitis were evident, *(8)* renal obstruction is detected earlier, *(9)* the gynecologist has had urologic training, *(10)* pulmonary edema and atelectasis are detected earlier and treated more promptly, *(11)* respiratory and/or cardiac irregularity is noted promptly by the anesthetist and heeded by the surgeon, and *(12)* elective operations are not performed when the surgical risk outweighs the need for surgical intervention

Charles C Abbott, M D

Pulmonary Lobectomy Ryan, B J, Surgery 27 551 558, 1950

The author reports on 134 consecutive lobectomies without a death In the foreword by Frank B Berry, attention is called to the remarkable advances made in this branch of surgery The fact that 125 of the pulmonary lobectomies were done by surgical residents attests to the accomplishments of the residency training program

Bronchiectasis accounted for the majority of lesions requiring lobectomy. The results were considered generally good even when bilateral lobectomy was necessary

Chronic pulmonary abscess was the second most common condition requiring lobectomy There were one-third as many cases in this group as in the group with bronchiectasis The results in this group were gratifying when one recalls the mortality rate for this condition in former years

Bronchiogenic carcinoma, tuberculosis, bronchial adenoma, bullous emphysema and chronic organizing pneumonia were each present in very small numbers In addition, one case of each of the following made up the group: asperigillosis, Boeck's sarcoid, bronchiectasis and tuberculosis, bronchiogenic carcinoma and tuberculosis, bronchiogenic cyst, coccidiodomycosis and nonspecific granuloma.

The importance of maintaining an adequate airway and a dry tracheobronchial tree and of providing sufficient oxygen during and after the operation is stressed.

In no case was a tourniquet lobectomy done. The hilar structures were dissected out and ligated individually in all cases.

Twenty-five of the patients had more than one lobe removed at operation, and 13 patients had two entire lobes removed at the same operation.

Constant vigilance during the first seventy-two hours after the operation is most important. Postoperative tracheal suction is routine. Good nursing care is essential.

Atelectasis, empyema and bronchopleural fistula are the most frequent complications.

The most remarkable feature of this report, aside from the fact that 134 pulmonary lobectomy operations were performed consecutively without a fatality, is the fact that there was a 99 per cent follow-up. Only by such excellent follow-up is it possible to know just how much justification there is for this operative procedure. Judging from the results obtained, one must conclude that pulmonary lobectomy is an extremely effective and relatively safe procedure for the therapy of many common pulmonary conditions.

M. O. CANTOR, M. D.

A Better Understanding of Uterine Contractility Through Simultaneous Recording with an Internal and a Seven-Channel External Method. Caldeyro, R.; Alvarez, H., and Reynolds, S. R. M.

The contractility of the human uterus during labor is recorded simultaneously by internal and external methods. The integration of results obtained by each method allows a much more complete understanding of uterine contractility than when either method is used alone.

In order to produce a normal and quick labor, the best characteristics of uterine contractility are as follows:

1. Large absolute intensity of the contractions of the whole uterus. 2. Strong fundal dominance. 3. Good synchronization between the different contractile parts of the uterus. 4. Regularity in the rhythm, intensity and form of the contractions. 5. Descent of the amniotic pressure during relaxation to the level of normal "tonus."

When uterine contractility deviates from these characteristics, labor proceeds more slowly or does not take place at all.

EDMUND LISSACK, M.D.

Lung Cancer Operability: Angiocardiographic Study of 53 Consecutive Proved Cases of Lung Cancer. Dotter, C. T.; Steinberg, I., and Holman, C. W., Am. J. Roentgenol. and Rad. Therapy. 64:222, 1950.

When the mediastinal and pulmonary blood vessels are observed to be opacified when studied angiocardiographically, the surgeon can often determine whether there is present a benign, circumscribed tumor that tends to push the vessels apart or whether he is dealing with an invasive growth that may even partly or completely occlude a major pulmonary artery. Angiocardiography is therefore proving of immense value in the diagnosis of operability of pulmonary neoplasms and may often be of value in enabling the surgeon to visualize more thoroughly the pathologic conditions present and to plan what particular procedure should be attempted.

RICHARD A. LEONARDO, M.D.

Imperforate Hymen with Hematocolpos. Daniel, Walter W., South. Surg. 16:473, 1950.

Imperforate hymen is not common, but it is quite important clinically. It is produced by the failure of the centrally located epilhelial cells of the posterior wall of the hymen to degenerate. This naturally prevents the mucus and blood from flowing out of the vagina, and they begin to dam back, producing in order hematocolpos, hematotrachelos, hematometrius and hematosalpinx. If the hymen is not taken care of, one of two things may happen—it may rupture or an infection may develop. This condition must be considered in differential diagnosis whenever amenorrhea is associated with difficulty in urination and pain in the lower part of the abdomen.

The treatment consists of making cruciate incisions to allow the dammed-up fluid to run out slowly, then excising the central area and suturing the cut edges. Postoperatively, Fowler's position is desirable.

EDMUND LISSACK, M.D.

Intussusception in the Adult. Donhauser J. L., and Kelly, E C Am J Surg 79 673 1950.

The authors have analyzed 665 cases from the literature of intussusception in persons over 15 years of age and have added 12 new cases from the files of the Albany Hospital The ages varied from 15 to 90 years with great predominance in the group between 15 and 30. The patients were predominantly male The most common etiologic factor was intestinal tumors of various sorts *Following* these were Meckel's diverticulum prior gastroenterostomy, prolapsed gastric mucosa and a long list of less common lesions Of the tumors in the series, 213 were benign and 123 were malignant

Of the so-called primary intussusceptions, 68 per cent were ileocecal, ileoileal *and* ileocolic, 19 per cent were colocolic, appendicocecal and cecocolic The remaining 13 per cent consisted of various other types

The authors urge a more specific classification based on the portion of intestine involved They suggest the following classification gastroduodenal, jejunogastric, duodenoduodenal, duodenojejunal, jejunojepunal, ileojejunal, ileoileal, ileocecal, ileocecocolic, appendicoappendical, appendicocecal, cecocolic, cololic, sigmoidosigmoidal, sigmoidorectal, colorectal and ileocolic.

The most common symptoms were nausea, vomiting, irregular recurrent attacks of colicky pain, and constipation Abdominal masses were present in half the cases Abdominal tenderness, rigidity and melena were least frequent As obstruction becomes more complete, the usual signs and symptoms develop

HOWARD STERN, M D

Intravenous Infusions of Invert Sugar. Weinstein, J J, Med Ann 19 179-182, 1950

In an effort to solve some of the nutritional problems of the surgical patient, particularly with regard to increasing caloric intake, the author studied the effect of administration of 5 per cent dextrose and 5 per cent invert sugar Cooperative male patients in the surgical wards were used

As a result of this clinical study, the author found that equal quantities of invert sugar may be given twice as fast as dextrose and yet the amount lost in the urine will be only one-tenth of that noted with dextrose This suggests that ten times as much dextrose as invert sugar would be lost to the patient For this reason, to increase the caloric intake of the postoperative patient it is suggested that invert sugar may be used instead of dextrose for intravenous infusion

M O CANTOR, M D

Obliteration of Pain at the Site of Reference by Intradermal Infiltration Anesthesia in First Stage Labor. Abrams, A A, *New England J Med 243 636, 1950*

This clinical study seems to bear out the referred character of pain in first stage labor, indicating a simple method by which it can be relieved either completely or to a large extent The effectiveness of the anesthesia is simultaneous with its administration, which in no way causes an alteration of the uterine tone or of the frequency, intensity and duration of uterine *contractions*

Intradermal anesthesia is *useful in first*-stage labor in that pain during the greater part of the labor is abolished without the use of sedatives, which cause *depressing effects*, particularly on the baby This type of anesthesia produces no local or systemic complications and requires no special knowledge or special aftercare The technic of infiltration is simple and can be used in the home as well as in the hospital

EDMUND LISSACK, M D

Endometriosis: A Report of 400 Cases. Fallon, J, Brosnan, J. T, Manning, J J, Moran, W G, Meyers, J, and Fletcher, E M Rhode Island M J 33 15, 1950

This paper is excellently illustrated It points out that endometriosis in women is more frequent than appendicitis and that its manifestations extend into many medical specialties The cardinal symptom is cumulative increase of menstruation with *some linked* phenomenon, usually pelvic pain, the pathognomonic sign is the characteristic feel' *of an endometrioma* This is best appreciated by simultaneous rectovaginal examinations The cardinal symptom and the pathognomonic sign are often lacking, and a more helpful method of diagnosis is to suspect the disease in women who are not having children It does occur in youth also, contrary *to general belief*

Peritoneoscopic study is indicated when doubt exists.

EDMUND LISSACK, M. D

The "Milk Factor" in Carcinoma of the Human Breast. Horne, H. W., New England J. Med. 243:373, 1950.

In an ingenious study Horne investigated the family histories of a series of women with cancer of the breast. Eighty-eight patients were chosen who, together with their mothers, were still living. A control group of 86 patients who had undergone external gynecologic procedures and in whom no neoplastic process had been discovered was also selected. The average age of the two groups was the same.

The question of whether the child had been nursed by the mother was examined carefully. Among the patients with cancer, 9 had never received any human milk, and among the patients of the control group 7 had never received any human milk.

Horne concluded that a woman may have cancer of the breast without ever having received any human breast milk.

M. T. FRIEDELL, M.D.

Hyperthyroidism, Pregnancy and Thiouracil Drugs. Bell, G. O., J.A.M.A. 114:1243, 1950.

Bell studied 21 women in whom Graves' disease and pregnancy of less than six months coexisted. In each instance therapy with thiouracil drugs was followed by surgical intervention and the results were very satisfactory, nor was there any maternal mortality. However, there occurred loss of the fetus in a third of the cases, and because of this the author emphasizes the fact that overtreatment with antithyroid drugs should be avoided, and that thyroid and iodine therapy may be advisable after thyroidectomy to prevent the possibility of hypothyroidism, which in his opinion may be an important factor in fetal mortality. The author also thinks that diethylstilbestrol may be indicated in these cases until after parturition.

RICHARD A. LEONARDO, M.D.

The Value of Punch Biopsy for the Diagnosis of Icterus in Retention (Valeur de la ponction-biopsie dans le diagnostic dea icteres par retention). Caroli, J., Acta Gastro-Enterologica Belgica 13:111, 1950.

The differential diagnosis between intrahepatic and extrahepatic obstructive jaundice without exploratory operation is often difficult, and the difficulty may not be resolved even by extensive consideration of the values recorded for various laboratory tests. It is desirable to establish a diagnosis of nonsurgical jaundice without adding abdominal laparotomy to the patient's troubles. For this purpose the author regards punch biopsy of the liver with the Silverman needle as a safe and useful procedure, and mentions that he has performed more than 200 such examinations with safety. However, he regretfully admits that in those cases which are most difficult to diagnose by clinical and laboratory means the liver biopsy is least likely to provide a clear-cut answer. In some cases it is impossible to arrive at conclusion regarding the site of obstruction without laparotomy. Noting that an exploratory operation in the presence of jaundice is dangerous, the author advises exploration by palpation and inspection supplemented by radiomanometric examination of the ducts (apparently operative cholangiography with measured pressures).

The author discusses various theories concerning the mechanism of regurgitation of bile. It is his opinion that the pathologic-histologic pictures of jaundice due to intrahepatic obstructions and that due to extrahepatic obstructions are similar; he has observed ectasia of the intertrabecular biliary capilliaries in both types of obstruction. He considers that jaundice of hepatogenous origin is caused most often by obstruction of these capillaries at the level of the canal of Hering, at the periphery of the lobule between the ampulla of the capillary and the portal bile ductule. However, he has been generally unable to demonstrate the exact site of obstruction in numerous sections made from specimens secured by punch biopsy. He admits it to be extremely unlikely that a section of liver showing intact portal areas may be secured by this method and states that ordinary methods of fixing and staining fail to show even the bile lying in ectatic capillaries. Since he considers that paraffin has a part in the absorption of the bile in the specimen, he uses a technic of staining with iodine before fixation and imbedding.

The article is illustrated with diagrams of the possible mechanisms of obstruction, photomicrographs of specimens secured by punch biopsy, and photographs of cholangiograms secured by radiomanometric examination at laparotomy.

LOUIS RIVER, M.D.

Biliary Lithiasis in the Young (La lithiase biliaire des jeunes) Chiez, M Debray C and Delattre, P, Acta Gastro Enterologica Belgica 13 89 99, 1950

This paper is a discussion of cholelithiasis as observed by the authors in patients who acquired the disease before the age of 30 and characterized by a different clinical and pathologic picture from that ordinarily noted when the disease occurs in older persons They describe as typical the association with endocrine and neurovegetative disorders particularly those concerned with ovarian function True colic is considered rare and the gallbladder can usually be visualized fairly well, although the shadow indicates atony and emptying is poor The stones are stated to be generally pure cholesterol small and showing only by contrast with the opaque medium The appearances of the gallbladder at operation, as well as the pathologic examination of its walls indicate to these authors that the inflammatory changes observed are not [illegible] versible It is considered that cholangiographic study carried out during the operation and later through the drain in the gallbladder supports this opinion, and hence that surgical intervention, when it becomes [illegible] necessary should usually be limited to [illegible] cholecystostomy Cholecystectomy is considered the operation of choice only in case there is [illegible] nt disease of the gallbladder wall or [illegible] radiomanometric cholangiography indi[illegible] obstructive disease at the neck of the gallbladder

[illegible] [illegible] M D

Massive Gastrointestinal Hemorrhage due to Jejunal Diverticula K[illegible] H D D Mc Mahon J A, and Kiely J P J A M A 142 1258, 1950

This paper presents a detailed investigation of a patient who after falling on the [illegible] and fracturing his hip began passing quantities of blood in his stool The authors measured the quantity of liquid black stool passed and since it was nearly all blood used that as a postulate for the total blood loss together with the usual hematologic criteria Blood replacement was undertaken to keep loss and restitution in balance

An exploratory laparotomy was performed with negative results except for multiple diverticula of the upper part of the jejunum, with pink bowel and no apparent evidence of retained blood in its lumen The abdomen was closed nothing having been done Continuation of the hemorrhage led to reoperation a week later at which time the diverticula-bearing area of jejunum was resected with ultimate recovery of the patient

Much is made of the fact that this is only the seventh case reported in the literature of hemorrhage from jejunal diverticula and the fourth case with morphologic observations in its support There were multiple mucosal erosions in many of the diverticula

The fact that at the first operation no dark contents were [illegible] in the bowel below the jejunal [illegible] and yet that the patient had [illegible] are a little difficult to [illegible] hemorrhage [illegible] feeling that perhaps the diverticula [illegible] have been from the [illegible] and contin[illegible] However the recovery [illegible] support [illegible] of the patient [illegible] the theory The fact that the patient [illegible] particular[illegible] apparently syphilitic is not [illegible] and replete[illegible] A graph of blood loss [illegible] sion two [illegible] artist's drawing of the [illegible] men and [illegible] graphs of the resected specimen [illegible] ness to [illegible] photographs add completeness to this presentation

[illegible] H A[illegible], M D

Gastric Ulcer Occurring After Vagotomy Morri[illegible] D M Brit M J 2 651, 1950

The [illegible] 2 [illegible] patients who had been operated upon previously, by thoracic vagotomy with transdiaphragmatic [illegible] the other by laparotomy with vagotomy

Both cases are well described The [illegible] levels in the first case both before and after vagotomy are portrayed by graph and in the second by record before vagotomy only In both cases gastric ulcer developed within six months of operation for duodenal ulcer, with no evidence of gastric ulcer present [illegible] In [illegible] in the first case [illegible] partial [illegible] apparent [illegible]

The [illegible]

A New Surgical Procedure in Scoliosis Therapy. Reith, P. L.; Hopkins, W. A., and Dunlap, E. B. Jr., South. Surg. 16:368, 1950.

The use of staples inserted across an epiphyseal plate to produce unilateral arrest of epiphyseal bone growth is meeting with the endorsement of orthopedic surgeons everywhere. The authors report from the Emory University Hospital on the use of these staples for the correction of scoliosis. The report is a preliminary one of a single case.

A combined thoracic and orthopedic surgical team approached the curve in the thoracic spine by division of the eighth, ninth and tenth ribs. After insertion of one staple a roentgenogram was obtained to verify the level of insertion. Three staples were then inserted across the intervertebral space of each of the intervals between the eighth, ninth, tenth and eleventh dorsal vertebral bodies. Two staples were inserted across the space between the seventh and eighth and the eleventh and twelfth vertebral bodies, making a total of thirteen staples.

Although the curves of scoliosis present a more complex mechanical problem than does the simple arrest of longitudinal bone growth, it is stimulating to read that the authors have attempted to correct this deformity by the use of staples. Reports of the end result will be awaited with great interest.

Les Diverticules du Duodenum. Boulvin, Roch: Acta Gastro-Enterologica Belgica, 13:161-172, 1950.

A brief review of the literature on duodenal diverticula is divided into sections on incidence, classification, sites, symptoms and diagnosis. The author considers that the mortality of surgical intervention for this condition, stated in 1936 to be approximately 10 per cent, should be no more than 2 or 3 per cent at present. He reports in detail the cases of 6 patients operated upon by him; 1 death occurred in this series, from acute necrotizing pancreatitis. During the dissection, in this case of a large diverticulum of the second portion from the adherent pancreas, there was considerable bleeding, difficult to control; in retrospect it was considered that gastrectomy with duodenal exclusion would have been preferable to persistent attempts to dissect the diverticulum free. The author believes that too little attention has been paid to the hyperacidity so frequently associated with a duodenal diverticulum, especially if the latter occurs in the first or second portion. Excision of the diverticulum has little curative effect on the psuedoulcerous syndrome found in many of these patients and none at all in those who have concomitant ulcer. Simple excision is felt to be applicable only when there is no hyperacidity and resection is physically possible without great risk. The author sets up some considerations of importance regarding the advisability of surgical intervention for duodenal diverticula. First: silent lesions, discovered incidentally, should not be treated surgically. Second: those producing only mild symptoms should be seen by the surgeon only after an adequate trial of medical management. Third: before operation is performed the surgeon must be sure that the digestive disturbances present are due to the diverticulum and not to lesions of adjacent organs. Fourth: since peri-Vaterian diverticula are the most frequent, it is well to recognize that many of them are accompanied by functional or organic disease of biliary or pancreatic passages, aggravated (or perhaps initiated) by the effects of retention at the neck of the diverticulum. It is noted that peri-Vaterian diverticula with complicating involvement of surrounding structures may require almost complete mobilization of the duodenum and resection of all the first portion and most of the second, along with subtotal gastrectomy. The author considers that in such cases gastrectomy is justifiable as an exclusion operation and for its effect in reducing acidity when the diverticulum is associated with ulcer. He describes a method of management which in his opinion will improve results and diminish operative morbidity and mortality.

Louis River, M. D.

Armamentarium

New Pressure and Vacuum Pumps: The firm of George A. Thiberg, Cedar Knolls, New Jersey, has recently begun the mass production of pressure and vacuum pumps which are small and compact in design yet efficient in operation. Many uses for them will be found in laboratory and medical fields. Boonton Molding Company molds the housing parts with American Cyanamid Company's Beetle Plastic. As a result, the units are silent in operation and can be turned out economically in quantity.

The air pumps are available in two models. Model 1 can be obtained either as an air pressure pump or as a vacuum type. Model 2 is an air pressure type in a larger size.

Model 1, which measures 4" in height and 3" in diameter, delivers approximately 800 cc per minute and has a maximum pressure of about 4 to 6 pounds.

This model is used as a vacuum pump in the surgical and hospital fields. It is claimed to be superior to the cumbersome vacuum pumps and devices used in the past. It creates a vacuum of about 12 feet of water and has proved useful as a pump for circulating air or gas in a closed vessel. Clinically it has been used in intratracheal suction; in the treatment of atelectasis, etc.; in thoracic, transdiaphragmatic and vesical operations, and in cases of abdominal distention.

Model 2 pump is slightly larger unit, measuring 5½" in height and 4" in diameter. It has a much larger output of air (approximately 3,000 cc. per minute) and will give a maximum pressure of 8 to 10 pounds. Since maximum pressure of 8 to 10 pounds.

Basic Amine Available: The New Product Development Department of the American Cyanamid Company announces the availability of 3,3′-iminobispropylamine in trial-lot quantities. This compound is a colorless, high-boiling, strongly basic amine. It is completely miscible at room temperature with water and most common organic solvents.

3,3′-iminibispropylamine has been found useful in the synthesis of ion exchange resins. The distributors state that its potentialities as an intermediate for the preparation of surface active agents, pharmaceuticals and dyestuffs should be investigated, since its linen structure and the three-carbon separation between amine groups differentiate it from other available polyamines.

New Product Bulletin No. 19, covering the physical and chemical properties of this new amine, and experimental samples will be supplied upon request to New Product Development Department, American Cyanamid Company, 30 Rockefeller Plaza, New York 20, New York.

Oxygen Tent and Humidifier: The new O-Plus oxygen tent is available in two sizes for the administration of oxygen to infants (12" diameter), children and adults (20" diameter). The construction and shape of the tent permit maximum circulation of oxygen and uniform distribution of temperature throughout, thereby washing out the CO_2 completely and preventing cold spots from forming, which reduces the possibility of the patient's catching a head cold.

Among the construction features are: an oxygen inlet baffle for equal dispersal of oxygen; an ice chamber for cooling purposes; an oxygen concentration meter for accurate oxygen-air ratio; a built-in thermometer, and CO_2 outlets. The tent is made of Dupont lucite, providing complete visibility from all sides for both nurse and patient. Because it is made of two separable parts, it is easy to clean; there are no seams to break open. The tent also contains an inlet that permits it to be used in penicillin therapy treatment.

The O-Plus humidifier can be used in conjunction with the tent where high humidity is required. The new O-Plus humidifier provides a method of administering vaporization, humidity or inhalation to patients with respiratory diseases, such as croup, acute laryngotracheal bronchitis and pneumonia. It is claimed to be the first free-acting nebulizer ever applied to creating high humidity, combining this high humidity with high oxygen content. The humidifier automatically establishes a fixed intensity, spread, velocity, volume and quality of fog.

Some of the features of the humidifier are as follows: it produces controlled high or low humidity up to 100 per cent; it produces extra fine fog; it responds accurately to sensitive adjustments; it is a true mechanical humidifier with no moving parts; no special trained personnel are required.

The O-Plus humidifier, flexible in adaptability, can be used with any oxygen tent, can be attached directly to the oxygen regulator to save space, and can be attached to a face mask for direct administration of oxygen or humidity.

A New Surgical Procedure in Scoliosis Therapy. Reith, P. L.; Hopkins, W. A., and Dunlap, E. B. Jr., South. Surg. 16:368, 1950.

The use of staples inserted across an epiphyseal plate to produce unilateral arrest of epiphyseal bone growth is meeting with the endorsement of orthopedic surgeons everywhere. The authors report from the Emory University Hospital on the use of these staples for the correction of scoliosis. The report is a preliminary one of a single case.

A combined thoracic and orthopedic surgical team approached the curve in the thoracic spine by division of the eighth, ninth and tenth ribs. After insertion of one staple a roentgenogram was obtained to verify the level of insertion. Three staples were then inserted across the intervertebral space of each of the intervals between the eighth, ninth, tenth and eleventh dorsal vertebral bodies. Two staples were inserted across the space between the seventh and eighth and the eleventh and twelfth vertebral bodies, making a total of thirteen staples.

Although the curves of scoliosis present a more complex mechanical problem than does the simple arrest of longitudinal bone growth, it is stimulating to read that the authors have attempted to correct this deformity by the use of staples. Reports of the end result will be awaited with great interest.

Les Diverticules du Duodenum. Boulvin, Roch: Acta Gastro-Enterologica Belgica, 13:161-172, 1950.

A brief review of the literature on duodenal diverticula is divided into sections on incidence, classification, sites, symptoms and diagnosis. The author considers that the mortality of surgical intervention for this condition, stated in 1936 to be approximately 10 per cent, should be no more than 2 or 3 per cent at present. He reports in detail the cases of 6 patients operated upon by him; 1 death occurred in this series, from acute necrotizing pancreatitis. During the dissection, in this case of a large diverticulum of the second portion from the adherent pancreas, there was considerable bleeding, difficult to control; in retrospect it was considered that gastrectomy with duodenal exclusion would have been preferable to persistent attempts to dissect the diverticulum free. The author believes that too little attention has been paid to the hyperacidity so frequently associated with a duodenal diverticulum, especially if the latter occurs in the first or second portion. Excision of the diverticulum has little curative effect on the psuedoulcerous syndrome found in many of these patients and none at all in those who have concomitant ulcer. Simple excision is felt to be applicable only when there is no hyperacidity and resection is physically possible without great risk. The author sets up some considerations of importance regarding the advisability of surgical intervention for duodenal diverticula. First: silent lesions, discovered incidentally, should not be treated surgically. Second: those producing only mild symptoms should be seen by the surgeon only after an adequate trial of medical management. Third: before operation is performed the surgeon must be sure that the digestive disturbances present are due to the diverticulum and not to lesions of adjacent organs. Fourth: since peri-Vaterian diverticula are the most frequent, it is well to recognize that many of them are accompanied by functional or organic disease of biliary or pancreatic passages, aggravated (or perhaps initiated) by the effects of retention at the neck of the diverticulum. It is noted that peri-Vaterian diverticula with complicating involvement of surrounding structures may require almost complete mobilization of the duodenum and resection of all the first portion and most of the second, along with subtotal gastrectomy. The author considers that in such cases gastrectomy is justifiable as an exclusion operation and for its effect in reducing acidity when the diverticulum is associated with ulcer. He describes a method of management which in his opinion will improve results and diminish operative morbidity and mortality.

Louis River, M. D.

Armamentarium

New Pressure and Vacuum Pumps: The firm of George A Thiberg, Cedar Knolls, New Jersey, has recently begun the mass production of pressure and vacuum pumps which are small and compact in design yet efficient in operation Many uses for them will be found in laboratory and medical fields Boonton Molding Company molds the housing parts with American Cyanamid Company's Beetle Plastic As a result, the units are silent in operation and can be turned out economically in quantity

The air pumps are available in two models Model 1 can be obtained either as an air pressure pump or as a vacuum type Model 2 is an air pressure type in a larger size

Model 1, which measures 4″ in height and 3′ in diameter, delivers approximately 800 cc per minute and has a maximum pressure of about 4 to 6 pounds

This model is used as a vacuum pump in the surgical and hospital fields It is claimed to be superior to the cumbersome vacuum pumps and devices used in the past It creates a vacuum of about 12 feet of water and has proved useful as a pump for circulating air or gas in a closed vessel Clinically it has been used in intratracheal suction, in the treatment of atelectasis, etc , in thoracic, transdiaphragmatic and vesical operations, and in cases of abdominal distention

Model 2 pump is slightly larger unit, measuring 5½″ in height and 4″ in diameter It has a much larger output of air (approximately 3,000 cc per minute) and will give a maximum pressure of 8 to 10 pounds Since maximum pressure of 8 to 10 pounds

Basic Amine Available: The New Product Development Department of the American Cyanamid Company announces the availability of 3,3′ iminobispropylamine in trial-lot quantities This compound is a colorless, high-boiling, strongly basic amine It is completely miscible at room temperature with water and most common organic solvents

3 3′-iminibispropylamine has been found useful in the synthesis of ion exchange resins The distributors state that its potentialities as an intermediate for the preparation of surface active agents, pharmaceuticals and dye stuffs should be investigated, since its linen structure and the three carbon separation between amine groups differentiate it from other available polyamines

New Product Bulletin No 19, covering the physical and chemical properties of this new amine, and experimental samples will be supplied upon request to New Product Development Department, American Cyanamid Company, 30 Rockefeller Plaza, New York 20, New York

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In Memoriam

WILTON PAUL TILLY, SR.

M.D., F.I.C.S.

Dr. Wilton P. Tilly, founder and head of the Tilly hospital and clinic of New Iberia, Louisiana, died suddenly in January at the age of 64. A graduate of the University of Tennessee in 1911, Dr. Tilly did postgraduate work at Loyola University in New Orleans and at several clinics in St. Louis. His internship was served at the University of Tennessee at Nashville. Before taking up residence and practicing in New Iberia, Dr. Tilly was for many years visiting surgeon at the Louisiana Charity Hospital and the Hotel Dieu, both in New Orleans, and was visiting surgeon and consultant of the Belvedere Sanitarium, New Orleans, and the Veteran's Hospital, Gulfport, Mississippi. At one time he was the owner of St. Rita's Surgical Infirmary in New Orleans, with which he aided the Sisters of Mercy in their hospital career in Louisiana. Dr. Tilly has been for some years associated with the Postgraduate School of Loyola University in teaching positions in the Departments of Bacteriology, Pathology and Surgery. His practice was devoted to general surgery.

Dr. Tilly was a past president of the Iberia Parish Medical Society and a member of the American Medical Association, the Louisiana State Medical Society, the Louisiana Third District Medical Society, the Southern Medical Society and the International College of Surgeons.

WALTER CHARLES FRENZEL

M.D., A.I.C.S.

On Nov. 26, 1950, Dr. Walter Charles Frenzel of Wausau, Wisconsin, died at the age of 51. Dr. Frenzel was graduated from the University of Illinois medical school and did postgraduate work at the University of Vienna in 1936. He served his internship at St. Anthony's Du Padua Hospital. A member of the surgical board of St. Mary's Hospital of Wausau since 1927, Dr. Frenzel had served also as chairman of the Nursing School since 1939. From 1926 he was an instructor in gynecology at St. Mary's School of Nursing.

In addition to holding the status of associate in the International College of Surgeons, Dr. Frenzel was a member of the American Medical Association, the Marathon County Medical Society and the Wisconsin State Medical Society.

AUSTIN R. QUIGLEY

M.D., F.A.C.S., A.I.C.S.

Austin R. Quigley, 65, died on April 16, 1950, in Maysville, Kentucky, where he had been practicing for many years. Dr. Quigley was graduated from the University of Louisville in 1907. During his period of postgraduate study he served on the visiting staffs of hospitals in Rochester, Boston, Chicago, St. Louis, Philadelphia and Louisville. His hospital internship was served at the May Street Infirmary in Louisville. Since 1911 Dr. Quigley had been a surgeon at the Maplewood Hospital in Maysville.

Dr. Quigley was a member of the following medical and surgical societies: the American Medical Association, the American College of Surgeons, the International College of Surgeons, the Southern Medical Association, and the Kentucky State and Mason County Medical Associations.

FRANCIS EDWARD JACOBS

M.D., A.I.C.S.

Recently Francis Edward Jacobs passed away at the age of 47. A graduate of the University of Oregon medical school, Dr. Jacobs completed postgraduate study at the San Diego County General Hospital and served his hospital internship and residency in surgery there. He also held a teaching position at the Nurses' Training School at the San Diego County Hospital. Primarily his practice was devoted to general surgery.

Dr. Jacobs was a member of the American Medical Association, the California Medical Association and the San Diego County Medical Society. He was also an Associate Fellow of the International College of Surgeons.

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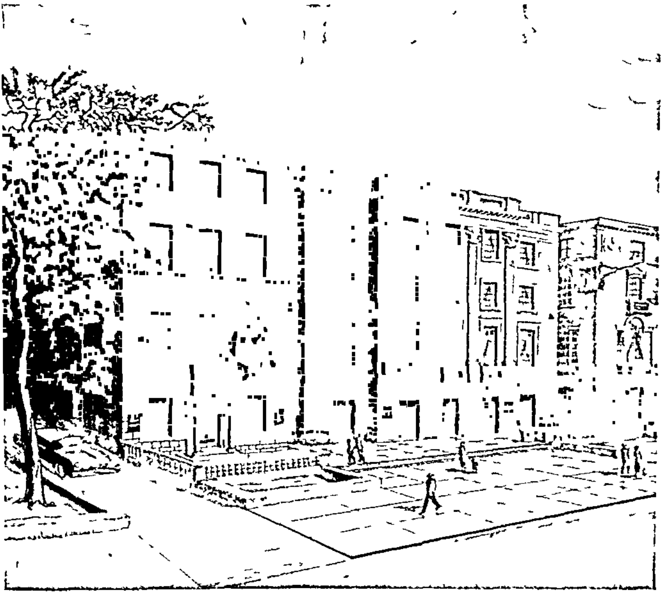

HOME OF THE
INTERNATIONAL COLLEGE OF SURGEONS

and the

UNITED STATES CHAPTER

1516 - 1526 Lake Shore Drive
Chicago 10, Illinois

CALENDAR OF MEETINGS

May, 1951

21-25 ....Société Internationale de chirurgie orthopédique
et de traumatologie
Stockholm
Dr. J. Delchef
34, rue Montoyer, Brussels

July, 1951

International Society of Blood Transfusion
London
Centre national de Transfusion sanguine
M. Bernard Rouzet
6, rue Alexandre Cabanel, Paris

September, 1951

3-7 ....International Anesthesia Research Society
London
Mr. R. W. Cope
University College Hospital, W C 1
London, England

10-14 ....United States Chapter, International College of Surgeons
in conjunction with the Canadian Chapter
Palmer House, Chicago
Dr. Arnold S. Jackson
1516 Lake Shore Drive
Chicago 10, Illinois

October, 1951

1-6 ....Congrès de l'Association française de Chirurgie
Paris
12, rue de Seine, Paris 6ème
Prof. Brocque
Congrès francais d'Oto-Rhino-Laryngologie
Paris
Dr. H. Guillon
6, avenue MacMahon, Paris

December, 1951

American Medical Association Clinical Session
Dr. George F. Lull
535 North Dearborn St.
Chicago 10, Illinois

FOUNDED BY DR. MAX THOREK

The Journal of the International College of Surgeons

FOUNDED IN GENEVA SWITZERLAND 1935 INCORPORATED IN WASHINGTON, D C, 1940

Vol XV MAY 1951 No 5

Original Articles

Diagnosis of Surgical Diseases of the Spleen

THOMAS H BATE MD, FACS, FICS
PHOENIX ARIZONA

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During the past few years many advances in knowledge of the physiology of the spleen have been made Figure 1 presents in a diagrammatic manner the function of the spleen

Advances have also been made in the field of hematology Figure 2 illustrates the hematopoietic system

The indications and contraindications generally accepted for splenectomy are as follows

Indications —(*a*) Banti's disease, (*b*) Felty's disease, (*c*) hemolytic jaundice, (*d*) primary splenic panhematocytopenia, (*e*) splenic neutropenia, (*f*) thrombocytopenic purpura, (*g*) thrombosis or anomalous obstruction of the splenic vein, (*h*) rupture of the spleen, and (*i*) cysts, primary tumors and abscesses

Possible Indications — (*a*) Gaucher's disease, (*b*) malaria, (*c*) ptosis, and (*d*) conditions for which the spleen is removed with the stomach

Contraindications — (*a*) acute splenic tumor, or acute infection, (*b*) Hodgkin's disease, (*c*) leukemia, (*d*) metastasis, (*e*) infestation with parasites (trichinosis, filariasis, kala azar, distomiasis), (*f*) pernicious anemia, (*g*) polycythemia, and (*h*) sickle cell anemia

BANTI S SYNDROME

There has been controversy over this syndrome since study of it was initiated by Banti in 1883 Not only has the etiologic background of the syndrome been disputed, but its actual existence has been challenged It is rather poorly defined and probably includes several entities which may eventually be established as independent syndromes, for [illegible]nce cirrhosis of the liver w

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Submitted for publication March 6 1951

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(*2*) abdominal thrombophlebitis, particularly thrombophlebitis of the splenic vein; (*3*) splenomegaly secondary to venous obstruction by extrinsic causes; (*4*) chronic infectious splenomegaly, and so on. The term "congestive splenomegaly" has been offered for this syndrome, since there is much evidence to suggest that a chronic obstructing lesion at the portal or splenic vein is responsible for the enlargement of the spleen. In the presence of progressive splenomegaly of long standing, it is not difficult to consider variable blood conditions (anemia, leukopenia or thrombocytopenia) as tertiary phenomena, dependent on the splenomegaly and not necessarily on the original pathologic change. At all events, the congestive hypothesis gives a good working basis for differential diagnosis.

Many workers now believe that if cirrhosis is not part of the original pathologic condition it does not necessarily develop. If congestive splenomegaly is to be explained from an anatomic standpoint, cirrhosis of the liver should occur first and the hepatic condition should give rise to chronic obstruction of the portal vein and secondary splenomegaly. If the splenic vein becomes obstructed by external pressure or intrinsic thrombophlebitis, the obstruction to the flow of blood will produce chronic passive congestion of the spleen and will result in progressive enlargement of this organ. It can also be seen, with such obstruction, why varicosities of the esophagus develop by a shunting of the circulation away from the portal vein and up through the gastric and esophageal vessels to the superior vena cava.

Abnormalities in the peripheral blood undoubtedly are secondary to the splenomegaly, although the nature of this is not clear. In the majority of cases there is some disturbance in the values for any or all of the elements in the circulating blood. In the presence of so-called splenic anemia there is ordinarily no evidence of hemolytic activity of the spleen. The anemia may be normocytic and normochromic, suggesting suppressed bone marrow activity, or, in some cases, particularly if cirrhosis of the liver is an outstanding feature, macrocytosis may be present. In cases in which repeated hemorrhage takes place, microcytic hypochromic anemia of the iron deficiency type may occur. Commonly there is leukopenia, which again may reflect increased phagocytic activity of the spleen or some suppressive effect on the bone marrow. The same can be said for thrombocytopenia.

After splenectomy the blood values usually return to more nearly normal levels; this is the greatest indication for splenectomy in this disease. A secondary benefit is that the blood which formerly went to and from the spleen is eliminated, and this reduces the load on the collateral circulation. However, there is usually no diminution in size of the patient's varicosities, and hemorrhage usually will recur. If the congestive or obstructive hypothesis is correct this may be expected, since splenectomy in no way alters the circulatory bed itself. If cirrhosis of the liver is primary, there is probably little to expect from splenectomy other than correction of the blood values which may be secondary to the hypersplenic condition. It is not to be expected that the cirrhotic process will be altered; if cirrhosis is present, the treatment should be that used for primary cirrhosis of the liver. With cirrhosis one of the shunting operations will alleviate the abnormal load on the circulatory bed.

In the differential diagnosis of this condition liver function tests should be employed. In cases in which abdominal thrombophlebitis involving the portal or splenic vein or both is present, there is often a history of recurring bouts of abdominal pain, fever, chills, leukocytosis and physical signs and symptoms suggestive of an acute condition of the abdomen. Splenic infarctions occur not uncommonly in association with this condition, and they may be extensive, giving rise to a splenic abscess. This rather poorly defined syndrome often is diagnosed by excluding the other causes of splenomegaly.

I. VASCULAR SYSTEM

A *Structure*

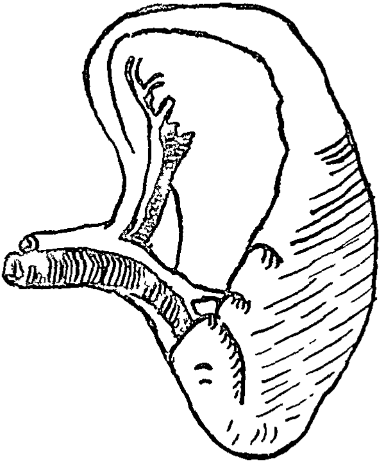
1. Artery
2. Sinusoid
3. Vein

B. Function

1. Reservoir for cells and plasma

C Diseases

1. Storage and congestive splenomegalies



II LYMPHOID SYSTEM

A. Structure

1. Lympho*blasts*
2. Lympho*cytes*

B Function

1. Unknown, may be concerned with endogenous protein metabolism

C Diseases

1. Serum sick*ness*
2. Chronic *lymphatic* leukemia
3. *Protein* intoxication

III RETICULOENDOTHELIAL SYSTEM

A Structure
  1 Endothelium
    a Clasmatocytes
  2 Reticulum
    a Clasmatocytes
    b Monocytes
    c *Reticulum cells*

B Function
  1 Phagocytosis
  2 Blood formation
  3 Platelet formation
  4 Leukocyte formation
  5 Erythrocyte formation
  6 Globulin
  7. Bacteria, debris, etc

C Diseases
  1. Splenic neutropenia
  2. *Purpura haemorrhagica*
  3. Congenital hemolytic jaundice
  4 *Abscesses, tumors, etc.*
  5 Ectopic blood formation
  6 *Immunity problems*

Fig. 1.—Functions of spleen as related to vascular, lymphoid and reticuloendothelial systems.

Diagnostic Points

Clinical
- Splenomegaly
- Hemorrhage from esophageal varices

Hematologic
1. Bone marrow:
   Variable with stage of disease. If no anemia, marrow is normal. Early stage reveals myeloid hyperplasia (Limarzi) "maturation arrest"; late stage reveals erythroid immaturity if cirrhosis is present, erythroid hyperplasia if bleeding occurs.
   Maturation arrest of myeloid series
   Increase of megakaryocytes if cirrhosis is present
2. Peripheral blood:
   Anemia
   Leukopenia

Other laboratory data
- Late stages of disease reveal
  - Increased icteric index
  - Positive liver function tests

FELTY'S DISEASE

This disease was described some twenty-five years ago. At present there is some controversy as to whether this constitutes a separate syndrome. Of the original 5 patients described 4 had anemia, whereas all had neutropenia. Unfortunately in these records no platelet count was recorded. The bone marrow is usually hypercellular, predominantly involving granulocytic elements, although some cases have been reported in which the marrow was aplastic. The spleen shows reticular hyperplasia and erythrophagocytosis. The usual clinical manifestations are: chronic deforming arthritis (rheumatoid), anemia, splenomegaly, leukopenia, cutaneous pigmentation and lymphadenopathy. Occasionally there are evidences of thrombocytopenic purpura. Many authors consider this panhematocytopenia, but of the secondary type, since the rheumatoid arthritis is the important feature of the disease.

Splenectomy may not be curative in this disease. Most authors record a definite improvement, but this may prove to be only temporary.

Diagnostic Points

Clinical
- Splenomegaly
- Rheumatoid arthritis
- Cutaneous pigmentation
- Lymphadenopathy

Hematologic
1. Bone marrow:
   Hyperplastic, predominantly involving granulocytes
2. Blood:
   Panhematocytopenia, usually leukopenia

HEMOLYTIC JAUNDICE

Congenital hemolytic jaundice, or Minkowski-Chauffard disease, must be differentiated from the acquired or Hayem-Widal type. In the average case of hemolytic jaundice there is little interference with the well-being of the patient except for the yellow coloration of the skin and slight anemia. Symptoms are occasionally not noted until adult life. Splenomegaly, jaundice, anemia, spherocytosis and increased fragility of the red blood cells are the prominent manifestations of familial jaundice. Reticulocytosis and increased urobilinogenuria are usually noted. The spleen can be greatly enlarged and may be ten times larger than normal. One-half to two-thirds of the patients have gallstones. The spleen's tendency to filter out and destroy the spherocytes is responsible for jaundice and splenomegaly.

Acquired hemolytic jaundice presents very similar manifestations to those just described. This type of hemolytic anemia may be the result of circulating hemolysins which may follow repeated transfusion of Rh-positive blood to an Rh-negative patient or the activation of some specific hemolysin in a syphilitic person exposed to cold, severe burns, bacterial infection or snake venom.

A third condition frequently confused with congenital hemolytic jaundice is Lederer's anemia. This is secondarily due

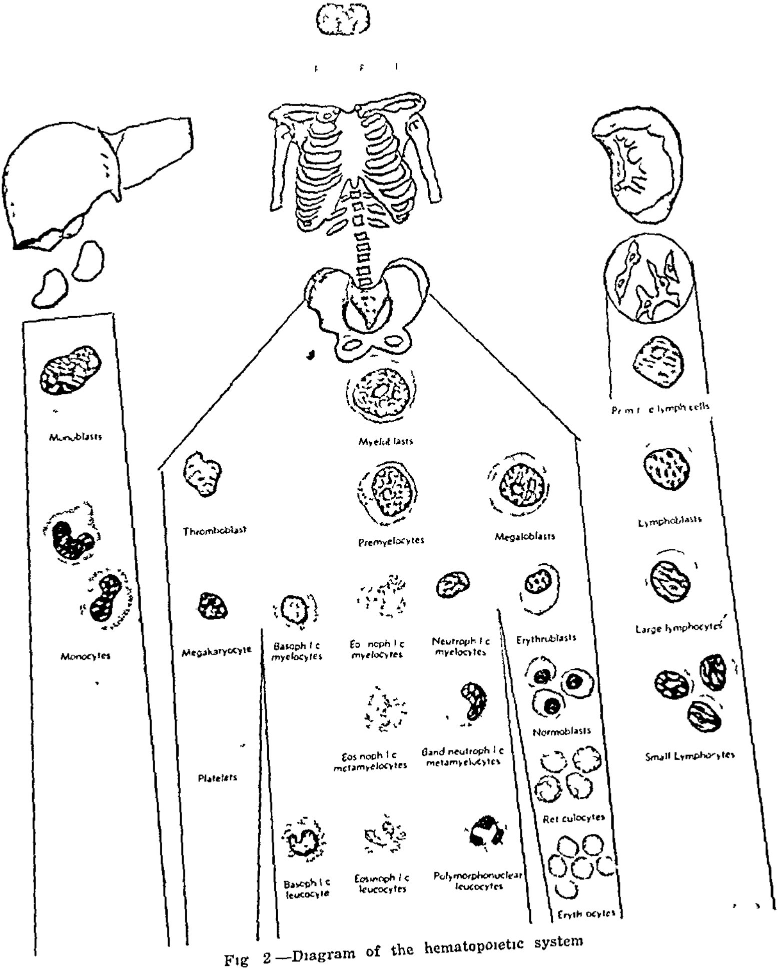


Fig 2—Diagram of the hematopoietic system

to an infectious process. It has been most commonly observed as following respiratory infections among children. There may be a palpable spleen, spheromicrocytosis and increased fragility. Lederer's anemia is corrected by blood transfusion.

Diagnostic Points

Clinical
- Splenomegaly
- Jaundice

Hematologic
1. Bone marrow:
   Panhyperplasia
2. Blood:
   Increase in nucleated red blood cells; reticulocytosis
   Anemia

Other laboratory data
- Increased fragility of red blood cells
- Urobilinogenuria

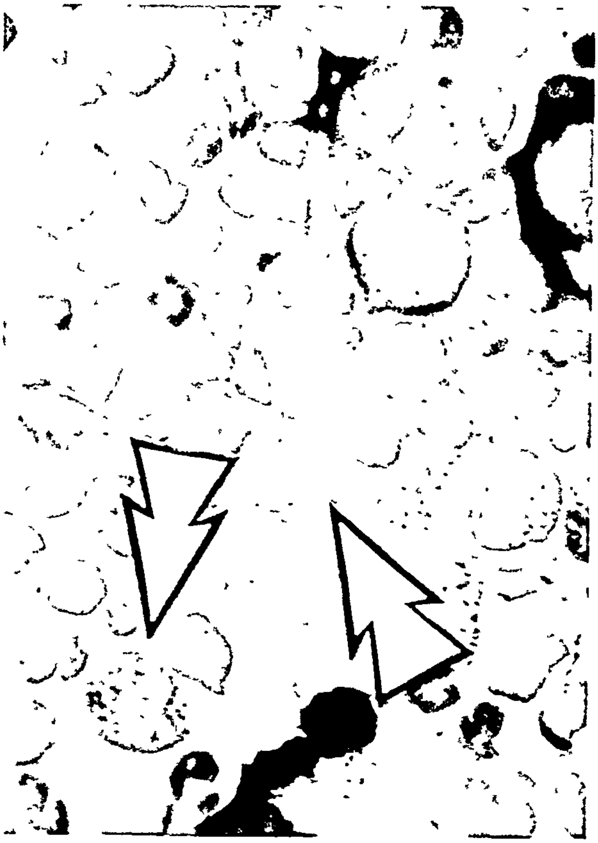


Fig. 3.—Bone marrow smear in an early case of Banti's disease. Arrow indicates megloblasts.

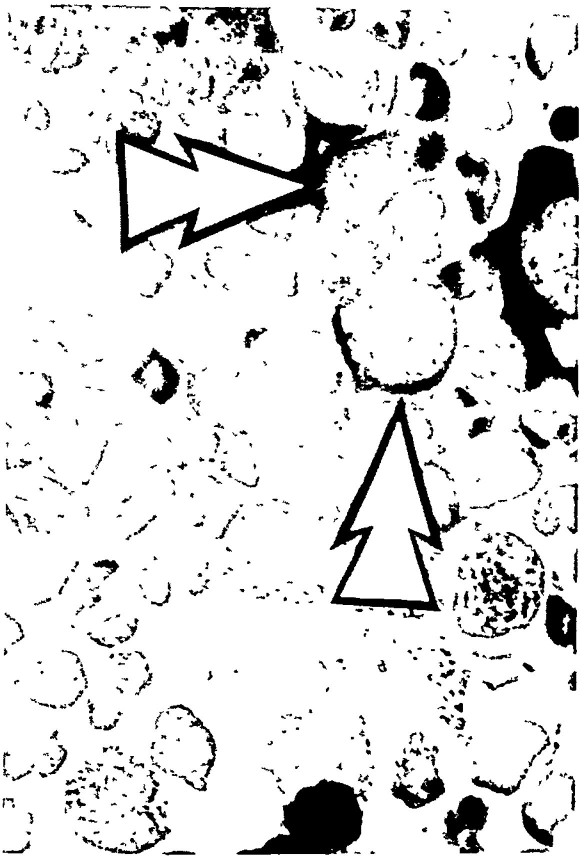


Fig. 4.—Bone marrow smear in a case of Felty's disease showing a hyperplasia involving chiefly the granulocytes. Arrows indicate a primitive myelocyte and a young neutrophil.

PRIMARY SPLENIC PANHEMATOCYTOPENIA

This is a rather rare disease of the spleen described by Doan and White in 1946. This disease may be congenital, acute or even secondary to such conditions as Hodgkin's disease, drug sensitization, Gaucher's disease, etc. The syndrome probably represents a type of hypersplenism in which the splenic hormonal functions become exaggerated, with the result that an inhibitory effect is produced on the maturation and delivery of granulocytes, erythrocytes and platelets from the bone marrow to the blood. Cases have been described in which the spleen at the same time destroys red blood cells excessively; thus a hemolytic component may be added to the three factors just named. Examination of the peripheral blood reveals neutropenia, anemia and thrombocytopenia; in other words, pancytopenia

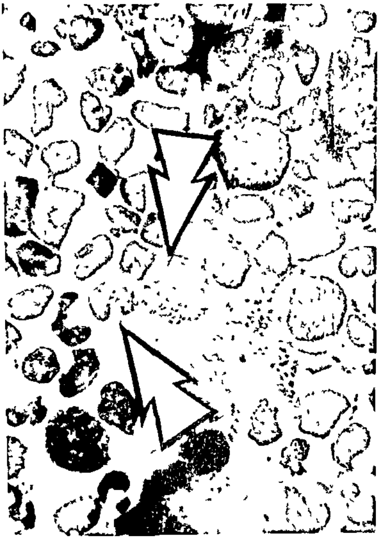


Fig. 5.—Bone marrow smear in a case of hemolytic jaundice showing hyperplasia of all series. Arrows indicate a myelocyte and a neutrophil.

results. This disease is a combination of hemolytic anemia, purpura and neutropenia. Bone smears show hyperplasia of all marrow elements, with the normoblasts predominating. These data on the bone marrow must be demonstrated before splenectomy is undertaken.

Diagnostic Points

Clinical
  Splenomegaly
  Fluctuating jaundice
  Malaise, pallor, weakness
Hematologic
  1. Bone marrow:
    Hyperplastic in all elements (predominantly normoblasts)
  2. Peripheral blood:
    Panhematocytopenia

SPLENIC NEUTROPENIA

This is a rather rare condition consisting of splenomegaly and peripheral granulopenia. This disease may represent a selective form of hypersplenism, in which the splenic hormones have a deleterious effect on the maturation and delivery of granulocytes from the bone marrow to the blood.

Wiseman and Doan have stated that there is little doubt that a single mechanism may be responsible for the various degrees of anemia, neutropenia or thrombocytopenia. Their cases show that all these elements were increased after splenectomy. They expressed the opinion that the syndrome described is closely akin to that of congenital hemolytic icterus and essential thrombocytopenic purpura and probably is the result of a comparable mechanism. The common denominator of

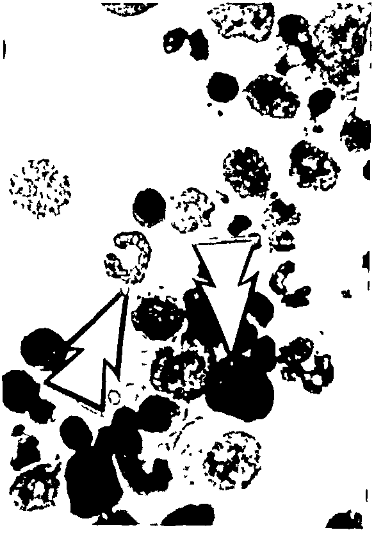


Fig. 6.—Bone marrow smear from a patient with splenic neutropenia, showing hyperplasia of the myeloid and erythroid series. Arrows indic. an erythrob a neutrophil.

Diagnostic Points in Surgical Diseases of the Spleen

	Symptoms	Bone Marrow Studies	Peripheral Blood Smears	Other Laboratory Procedures
Banti's disease	1. Splenomegaly 2. Hemorrhage from esophageal varices	1. Variable by stage of disease (a) If no anemia marrow is normal (b) Early 1. Myeloid hyperplasia (Limarzi) "maturation arrest" (c) Late 1. Erythroid immaturity if cirrhosis is present 2. Erythroid hyperplasia if bleeding occurs 3. Maturation arrest of myeloid series 4. Increase of megkaryocytes if cirrhosis is present	1. Anemia 2. Leukopenia	1. Late stages of disease (a) Increased ic eric index (b) Positive liv function tes
Felty's disease	1. Rheumatoid arthritis 2. Splenomegaly 3. Cutaneous pigmentation 4. Lymphadenopathy	1. Hyperplastic, predominantly involving granulocytes	1. Panhematocytopenia	
Hemolytic jaundice	1. Splenomegaly 2. Jaundice 3. Anemia	1. Hyperplasia (a) Myeloid (b) Erythroid (c) Megakarocytic	1. Increase in nucleated red blood cells	1. Increased fragil of red blood cel 2. Urobilinogenuri
Primary splenic panhematocytopenia	1. Splenomegaly 2. Fluctuating jaundice	1. Hyperplastic in all types with the normoblasts predominating	1. Panhematocytopenia	
Splenic neutropenia	1. Splenomegaly 2. Occasional oral ulceration 3. Occasional mild icterus	1. Hyperplastic (a) Myeloid series (b) If hemolytic jaun- is present: 1. Erythroid series 2. No abnormal cells present 3. Not leukemic	1. Marked specific neutropenia 2. Anemia, macrocytic hyperchromic type 3. Reticulocytosis if anemia is present 4. Thrombocytopenia variable	
Rupture of spleen	1. Acute-Accidental (a) Pain LUQ (b) Shock 2. Delayed (a) Interval between accident and onset (b) Pain LUQ (c) Pain in left shoulder		1. Leukocytosis and anemia, depending on hemorrhage	1. Gastrectasia 2. Serration lower border of stoma 3. Absence of sple shadow 4. Inferior displac ment of splenic flexure
Thrombocytopenic purpura	1. Purpuric spots 2. Bleeding from membranes and orifices 3. Positive tourniquet test 4. Increased capillary fragility	1. Increase in number of immature megakarocytes without platelet formation	1. Low platelet count 2. Anemia	1. Normal coagulation 2. Poor clot retraction

Diagnostic Points in Surgical Diseases of the Spleen (Continued)

	Symptoms	Bone Marrow Studies	Peripheral Blood Smears	Other Laboratory Procedures
Thrombosis of splenic vein	1 Splenomegaly 2 Jaundice 3 Anemia	1 Myeloid hyperplasia (maturation arrest)	1 Anemia 2 Leukopenia 3 Thrombopenia	
Gaucher s disease	1 Splenomegaly 2 Pigmentation of skin 3 Yellow pigmentation of cornea 4 Heptomegaly 5 Palpable thickening of long bones	1 Foam of Gaucher s cells 2 Reticulum cells	1 Panhematocytopenia	1 Angular deformity of spine 2 Pathologic fractures 3 Clubbing of left third of femur 4 Flattening of head of femur

all three diseases is profound granulocytopenia, panhyperplasia of the bone marrow, a large spleen, and cure by splenectomy, also, varying degrees of anemia and thrombocytopenia, which were asymptomatic and correctable by removal of the spleen

In the opinion of these investigators, a single mechanism was responsible for the varying degrees of anemia, neutropenia and thrombocytopenia The spleens all showed excessive phagocytosis of granulocytes, red cells and platelets They concluded that the syndrome is due to hypersplenism in which there is an accentuation of the physiologic function of disposing of blood cells and that it is comparable to hemolytic icterus and essential thrombocytopenic purpura In the former disease the phagocytic activity of the spleen is directed chiefly against the red blood cells, in the latter, chiefly against the platelets, and in the neutropenic syndrome, chiefly against the granulocytes

Diagnostic Points

Clinical
  Splenomegaly
  Occasionally purpura (depends on degree of associated thrombocytopenia)
  Occasionally oral ulceration (depends on acuteness and severity of neutropenia)
  Occasionally mild icterus (depends on degree of associated anemia)
Hematologic
  1 Bone marrow
    Hyperplastic for myeloid series and, if hemolytic anemia is pronounced, erythroid series
    No abnormal cells present

  2 Peripheral blood
    Marked neutropenia
    Anemia when present is macrocytic in type
    Reticulocytosis if anemia is present
    Increased indirect van den Bergh,

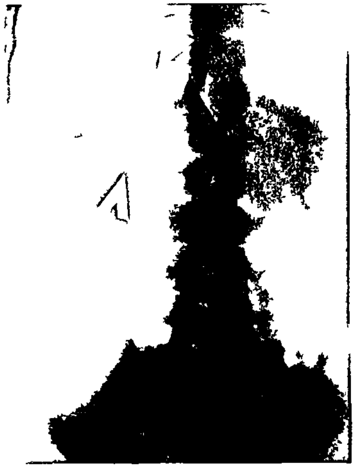


Fig 7—Scout roentgenogram of abdomen in a case of ruptured spleen Arrows indicate gastric tasia serration of greater curvature, absence of splenic shadow and in this case only a slight depression of the splenic fl

depending on the degree of anemia noted
Thrombocytopenia variable

THROMBOCYTOPENIC PURPURA

This disease may be either primary or secondary. The removal of the spleen in cases of the secondary type is usually unsatisfactory. Clinical manifestations of essential or primary thrombocytopenic purpura are: prolonged bleeding time, normal coagulation, poor clot retraction or none, a low platelet count, anemia, ecchymosis, petechiae and bleeding from the mucous membranes or body orifices. The anemia is related to the loss of blood and usually gives rise to weakness and malaise. A useful diagnostic procedure is the tourniquet test. The blood pressure cuff, placed on the arm in the usual fashion and inflated, produces positive formation of petechiae. The spleen may be only slightly enlarged or not palpable. The marked splenic enlargement speaks against primary thrombocytopenic purpura. Examination of the bone marrow is usually diagnostic. The typical picture is an increase in the number of immature megakaryocytes without platelet formation, apparently due to the inhibiting effect of the spleen upon their maturity and release from the bone marrow into the peripheral blood. Other views as to the cause of thrombocytopenic purpura are that it is due to excessive destruction of platelets by the spleen or to abnormality of the capillaries. It has been noted in microscopic observation of nail bed capillaries that normal capillaries retract quickly on injury, but the capillaries of persons affected with certain hemorrhagic diseases, such as the purpuras or pseudohemophilia, are tortuous and do not retract normally. In the presence of thrombocytopenic purpura the capillaries fail to retract normally and the extravasated clot does not form a well contracted coagulum in the wound. The diagnosis of essential thrombocytopenic purpura depends upon recognition of three factors included in its descriptive title, namely: (1) abnormal capillary fragility; (2) thrombocytopenia, and (3) exclusion of the known causes of these conditions.

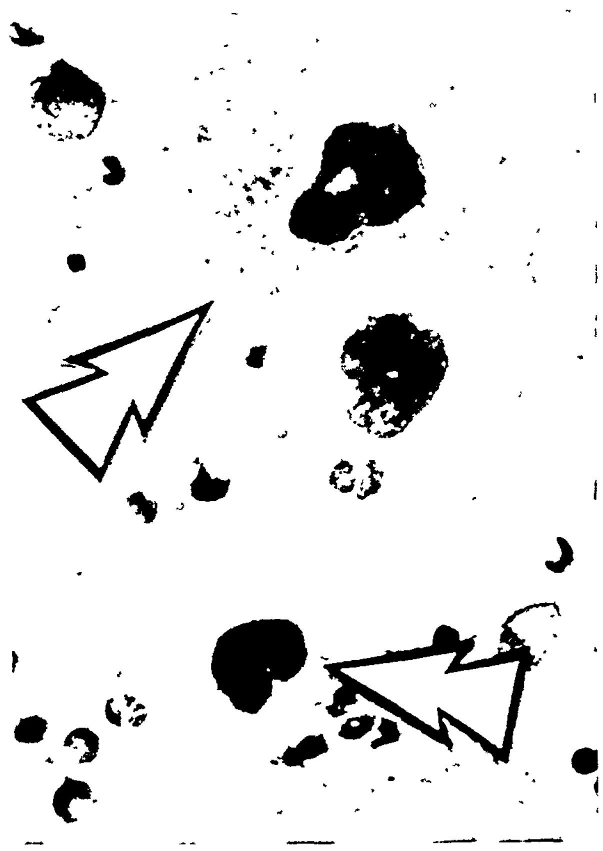


Fig. 8.—Bone marrow smear in a case of thrombocytopenic purpura. Arrows indicate megakaryocytes.

There are three general types of nonthrombocytopenic purpura:

1. *Allergic purpura:* This group includes (a) purpuric manifestations sometimes associated with other manifest allergic disorders and (b) cases in which a definite antigen can be incriminated.

2. *Symptomatic purpura:* This group includes the nonthrombocytopenic purpuras sometimes associated with acute infectious diseases, or following the bite of viperine and crotaline snakes and sometimes following the ingestion of certain drugs, such as belladonna, the iodides, quinine, the salicylates, the anticoagulants and heavy metals such as mercury and bismuth. Purpuric manifestations are sometimes associated with advanced renal and cardiac diseases. Scurvy could be

classified as a form of symptomatic purpura.

3. *Idiopathic purpura:* This group includes nonthrombocytopenic purpura, purpuric bleeding from the gastrointestinal tract (e.g., Henoch's purpura) and the bleeding into the joints, rheumatic purpura of Schoenlein. Occasionally these are classified under the allergic group. Other conditions classed in this group are: purpura anularis telangiectodes, pigmented purpuric lichenoid dermitis, Shamberg's disease, purpura simplex and orthostatic purpura.

Diagnostic Points

- Clinical
  - Purpuric spots
  - No splenomegaly
  - Positive tourniquet test
  - Bleeding from mucous membranes and body orifices
  - Increased capillary fragility
- Hematologic
  1. Bone marrow:
     - Increased number of immature megakarocytes without platelet formation
  2. Peripheral blood:
     - Low platelet count
     - Anemia (if bleeding is pronounced)
- Other laboratory data
  - Coagulation mechanism
    - Normal coagulation
    - No clot retraction
    - Prolonged bleeding time

THROMBOSIS OR ANOMALOUS OBSTRUCTION OF THE SPLENIC VEIN

The manifestations of chronic obstruction of the splenic vein are similar to those of early Banti's disease, namely splenomegaly, with slight varying degrees of anemia, leukopenia and thrombopenia. Hemorrhage from the esophageal varices is common. Jaundice is usually not present. The bone marrow picture is similar to that of early Banti's disease. Most authors agree that splenectomy cures this condition when performed reasonably early.

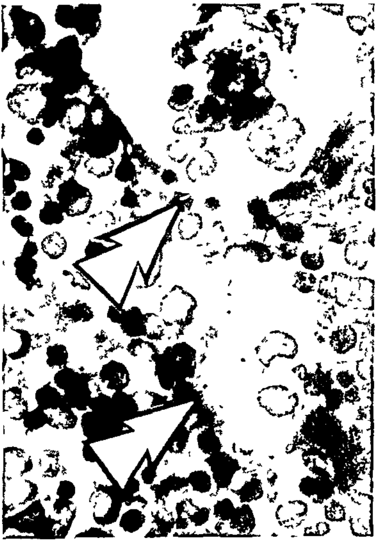


Fig. 9.—Bone marrow smear in a case of Gaucher's disease. Arrows indicate the foam cells.

Diagnostic Points

- Clinical
  - Splenomegaly
  - Hemorrhage from esophageal varices
- Hematologic
  - Bone marrow:
  - Myeloid hyperplasia (maturation arrest)
  - Peripheral blood:
  - Leukopenia
  - Anemia

ACUTE RUPTURE

Acute rupture of the spleen may occur at any age and in persons of either sex. It is most common between the second and fourth decades and is more frequent in the healthy, active male. A history of trauma is always present. The trauma may be penetrating, perforating, crushing, or by direct force, usually applied over the upper left abdominal quadrant.

Associated injuries are common and often overshadow the ruptured spleen. The patient must be examined and evaluated very carefully.

Symptoms.—The symptoms are (1) pain and tenderness over the upper left quadrant and (2) pain in the left scapula or shoulder.

Physical Examination. — This reveals (1) muscle guarding of the upper left quadrant and (2) signs of intra-abdominal hemorrhage, such as shock, rapid pulse, pallor, thirst, falling of blood pressure and shifting dullness.

Laboratory Data.—A scout film of the abdomen will usually show the four cardinal points of rupture of the spleen, namely: (a) gastrectasia (gaseous dilatation of the stomach); (b) serration along the greater curvature of the stomach; (c) obliteration of the splenic shadow, and (d) inferior displacement of the splenic flexure.

DELAYED RUPTURE

After an injury to the back or the lumbar area of the anterior abdominal wall, which may be so mild that the patient forgets the accident, there may be more or less pain, with some nausea and perhaps even mild shock. After several hours these symptoms disappear completely, or at most only leave a vague discomfort in the upper part of the abdomen. The patient then enters the so-called latent period and is able to be up and around. The minimum length of the latent period should be about forty-eight hours, though it may be longer. The latent period, of course, depends upon the massiveness of the hemorrhage and the extent of the splenic laceration.

Symptoms. — The principal symptoms are (1) pain and tenderness over the upper left abdominal quadrant and (2) pain in the left scapula or shoulder.

Physical Examination.—The signs disclosed are (1) tenderness over the upper left quadrant, and occasionally muscle guarding; also (2) there may be slight abdominal distention.

Laboratory Data.—Roentgen study reveals (1) gastrectasia (gaseous dilatation of the stomach); (2) serration along the greater curvature of the stomach; (3) obliteration of the splenic shadow, and (4) occasionally an inferior displacement of the splenic flexure of the colon. The white blood cell count shows leukocytosis, depending upon the size of the hemorrhage. The red cell count indicates anemia, depending on the size of the hemorrhage.

GAUCHER'S DISEASE

This disease was first described in 1882. Its primary pathologic feature is the deposition of large amounts of lipoid material in the spleen, bone and lymph nodes. It is more common in young females of the Jewish race than in other categories. It is characterized by a moderate degree of anemia; invariable leukopenia; a tendency to bleeding of the nose; a brownish-yellow pigmentation of the skin; frequently a yellow, wedge-shaped thickening of the conjunctiva on both sides of the cornea; a moderate amount of enlargement of the liver (in the later stages of the disease), and an enormous enlargement of the spleen, which is frequently the presenting symptom. This disease may affect more than one member of a family. Bone changes are common. The chief of these are an angular deformity of the spine; thickening of some of the long bones and pathologic fracture; also a rarefaction of most bones of the skeleton, including the vertebra, so that the stature may be stunted; a fusiform or clubbed lower third of the femur with some flattening of the femoral head. Etiologically the bone marrow appears to be just as important as the spleen, which explains why splenectomy is only palliative. Occasionally panhematopenia develops. When this occurs splenectomy is definitely indicated. In the absence of panhematocytopenia, splenectomy is rarely indicated in the later stages of this disease. The only relief gained is that of comfort, due to removal of the weight and pressure of the spleen.

Diagnostic Points

Clinical

- Splenomegaly
- Tendency to bleeding
- Yellow pigmentation of the cornea
- Yellowish brown discoloration, chiefly about the face and neck
- Enlargement of the liver
- Thickening of the long bones

Roentgenographic

- Angular deformity of the spine
- Pathologic fractures
- Rarefaction of most of the bones of the skeleton, including the vertebrae
- Clubbing or fusiform thickening of the lower third of the femur
- Flattening of the head of the femur

Hematologic

1. Observations in bone marrow:

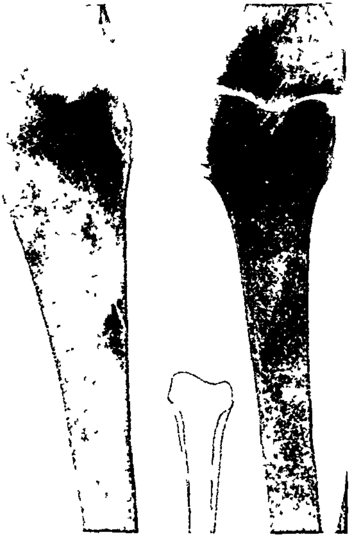


Fig. 10.—Roentgenogram of the femur in a case of Gaucher's disease. The "Erlenmeyer flask" shape is demonstrated.

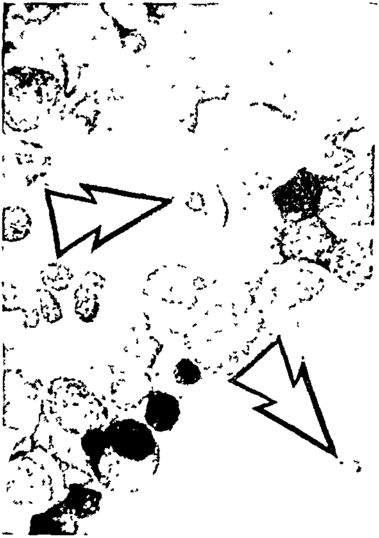


Fig. 11.—Bone marrow smear from a case of malaria. Arrow indicates a parasite.

Foam cells or Gaucher's cells (these are diagnostic)

2. Peripheral blood:
   Leukopenia
   Varying anemia
   Occasionally panhematocytopenia

CYSTS, PRIMARY TUMORS AND ABSCESSES

Although these lesions are frequently cured by splenectomy, the diagnosis is exceedingly difficult and is usually made only by exclusion. Many of these cysts are true cysts of the dermoid or lymphangiomatist type. Eighty per cent are false cysts of the hemorrhagic type, usually the result of trauma, parasites or inflammation. Abscess of the spleen is rare. Its diagnosis is almost impossible. If the spleen is not densely adherent, it should be removed; otherwise drainage may be the procedure of choice.

PTOSIS

Occasionally the spleen may fall from its original position and become enlarged, either primarily or as a result of some associated condition, such as one of the congestive splenomegalies. When this occurs there is a sense of fullness and pressure in the abdomen. Relief of the pressure symptoms may be gained by splenectomy.

MALARIA

Occasionally splenectomy is indicated in the treatment of chronic malaria. One of the first symptoms is pressure due to the enlargement of the spleen. Splenectomy is permissible to relieve the symptoms only when the disease has been completely eradicated. When recurrent attacks of malaria develop in spite of adequate therapy and a large spleen is present, splenectomy is justifiable.

SUMMARY

The author presents an exhaustive survey of diseases of the spleen amenable to surgical treatment, with emphasis on points of diagnosis. Indications and contraindications for operation are outlined. The laboratory tests and procedures are described, including studies of the blood and the bone marrow. The clinical picture of each pathologic entity is examined. The accompanying table summarizes the points useful in diagnosis.

ZUSAMMENFASSUNG

Der Verfasser gibt einen umfassenden Ueberblick ueber Milzerkrankungen, die chirurgischer Behandlung zugaenglich sind; er hebt Punkte hervor, die in der Diagnosestellung nuetzlich sind und umreisst die Indikationen und Gegenindikationen zur Operation. Er beschreibt die angewandten Laboratoriumsuntersuchungen und verfahren einschliesslich der Blutund Knochenmarksstudien und gibt eine Darstellung der klinischen Bilder der einzelnen pathologischen Zustaende.

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L'auteur présente dans le travail un exposé très détaillé des maladies de la rate qui peuvent se traiter chirurgicalement; l'auteur insiste sur certains détails très utiles au diagnostic. On détermine aussi les indications et les contre-indications opératoires. On décrit encore les tests de laboratoire, les procédés employés et les analyses du sang et de la moelle osseuse. On y inclue aussi la description clinique de chaque entité morbide.

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Se presenta una revisión completa de las enfermedades esplénicas susceptibles de tratamiento quirúrgico, insistiendo sobre puntos útiles para el diagnóstico. Se señalan las indicaciones y contraindicaciones operatorias. Se describen las pruebas y procedimientos de laboratorio empleados, incluyendo estudios hemáticos y de médula ósea. Se incluye el cuadro clínico de cada padecimiento.

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PTOSIS

Occasionally the spleen may fall from its original position and become enlarged, either primarily or as a result of some associated condition, such as one of the congestive splenomegalies. When this occurs there is a sense of fullness and pressure in the abdomen. Relief of the pressure symptoms may be gained by splenectomy.

MALARIA

Occasionally splenectomy is indicated in the treatment of chronic malaria. One of the first symptoms is pressure due to the enlargement of the spleen. Splenectomy is permissible to relieve the symptoms only when the disease has been completely eradicated. When recurrent attacks of malaria develop in spite of adequate therapy and a large spleen is present, splenectomy is justifiable.

SUMMARY

The author presents an exhaustive survey of diseases of the spleen amenable to surgical treatment, with emphasis on points of diagnosis. Indications and contraindications for operation are outlined. The laboratory tests and procedures are described, including studies of the blood and the bone marrow. The clinical picture of each pathologic entity is examined. The accompanying table summarizes the points useful in diagnosis.

ZUSAMMENFASSUNG

Der Verfasser gibt einen umfassenden Ueberblick ueber Milzerkrankungen, die chirurgischer Behandlung zugaenglich sind; er hebt Punkte hervor, die in der Diagnosestellung nuetzlich sind und umreisst die Indikationen und Gegenindikationen zur Operation. Er beschreibt die angewandten Laboratoriumsuntersuchungen und verfahren einschliesslich der Blutund Knochenmarksstudien und gibt eine Darstellung der klinischen Bilder der einzelnen pathologischen Zustaende.

RÉSUMÉ

L'auteur présente dans le travail un exposé très détaillé des maladies de la rate qui peuvent se traiter chirurgicalement; l'auteur insiste sur certains détails très utiles au diagnostic. On détermine aussi les indications et les contre-indications opératoires. On décrit encore les tests de laboratoire, les procédés employés et les analyses du sang et de la moelle osseuse. On y inclue aussi la description clinique de chaque entité morbide.

RESUMEN

Se presenta una revisión completa de las enfermedades espléncias susceptibles de tratamiento quirúrgico, insistiendo sobre puntos útiles para el diagnóstico. Se señalan las indicaciones y contraindicaciones operatorias. Se describen las pruebas y procedimientos de laboratorio empleados, incluyendo estudios hemáticos y de médula ósea. Se incluye el cuadro clínico de cada padecimiento.

RIASSUNTO

L'A. presenta un esame esaurito delle malattie della milza risponsabile al trattamento chirurgico, con enfasi sui punti vantaggiosi nella diagnosi. Delinea l'indicazioni e contra-indicazioni operatorie. Descrive gli esami laboratori e procedimenti impiegati, compresovi studi del sangue e midolla ossea. Il quadro clinico di ogni entita' patologica e' incluso.

SUMÁRIO

O autor apresenta um exaustivo estudo de doenças do baço suscetiveis de tratamento cirúrgico realçando os pontos capitais para o diagnóstico. As indicações e contra-indicações operatórias são estabelecidas. Os exames de laboratorio e os processos empregados são descritos, incluindo estudos de sangue e medúla óssea.

O quadro clinico de cada entidade patológica é incluido.

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Study of Breast Secretion for Detection of Intramammary Pathologic Change and of Silent Papilloma

DUDLEY JACKSON, M.D., F.A.C.S., AND DAVID A. TODD, M.D., F.A.S.C.P., AND
PAUL L. GORSUCH, M.D.

SAN ANTONIO

THE purpose of this paper is to describe what we believe to be a valuable diagnostic aid in detection of the "silent," or early, papilloma of the breast. It is based on the cytologic study of fluid expressed from the nipple during routine breast examinations. This preliminary report embraces a series of 3,013 patients who, in the seven-year period from 1942 through 1949, came to the office complaining of some type of mammary disorder. We wish to make it clear in the beginning that this is in no way a test for mammary cancer, but merely a method for early detection of breast papilloma, a lesion which we, with many eminent pathologists and surgeons, believe to be premalignant.

The technic of examination is as follows: With the patient lying on the examining table, the breast is supported by the left hand without trauma. The nipple is then grasped firmly at its base with the thumb and index finger of the right hand. The fluid contained in the ducts of the nipple is then milked to the surface by rolling the thumb and finger against each other toward the tip of the nipple. This must be done in three or four different axes in order that no ducts may be missed. The secretion thus obtained is then touched to a slide. A second slide is placed flat against the first and slid lengthwise without pressure to distribute the fluid evenly. The slide is immediately placed in a mixture of equal parts of 95 per cent alcohol and ether and thereafter prepared according to the technic described by Papanicalaou for cervical smears. One of us (Dr. Todd) has found that hematoxylin and eosin stains give him his best results.

In this group of 3,013 patients there were 2,109 or 70 per cent, who had no pathologic condition demonstrable, either by physical examination or by cytologic study.

There were 1,309 from whose nipples we were able to obtain secretions during either the initial or subsequent examinations. Several patients were examined more than once; in fact, the secretions of some were examined as many as fifteen times. Others had either only one breast, postoperatively, or more than two breasts. In 1 instance a woman presented herself with six breasts, and fluid was obtained from five.

The color and consistency of the secretions obtained were noted. The color varied from pearl, light green, turquoise green, milk-colored, dark brown to almost black, serosanguinous to frank blood. The consistency ranged from thin and watery through thick and oily material to the semisolid comedo type associated with comedomastitis.* The amount varied from a small drop to a cubic centimeter or more.

Early in our observations it was noted that secretion from one quadrant of a breast might be in the normal range, whereas another quadrant would produce, for example, a dark green or a frankly bloody fluid. In this manner we could localize rather definitely the quadrant containing a papilloma.

Submitted for publication Oct. 8, 1950

*The consistency of breast secretions and their significance was studied and recently reported by Beasley of Atlanta and Donnelly of the University of Iowa in two excellent papers.

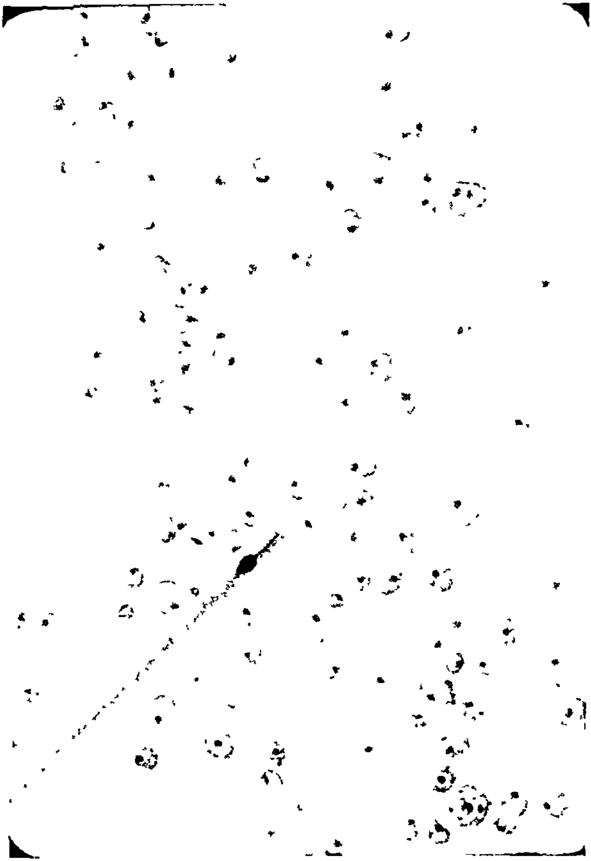

Fig 1.—Normal exfoliated cells. Note variable size but uniform shape; small nuclei, usually eccentric. Cytoplasm pink staining granular. Hematoxylin and eosin stain; × 160.

In 160 cases the existence of an intraductal or intracystic papilloma was confirmed either microscopically or grossly in the resected quadrant of breast. The patients had either a thin and watery, a serosanguinous or a frankly bloody fluid.

In addition, we have been able to classify secretions from 217 patients as showing definite epithelial hyperplasia. This group has been closely and carefully followed; and we have been rewarded by ch [illegible] ral instances the later

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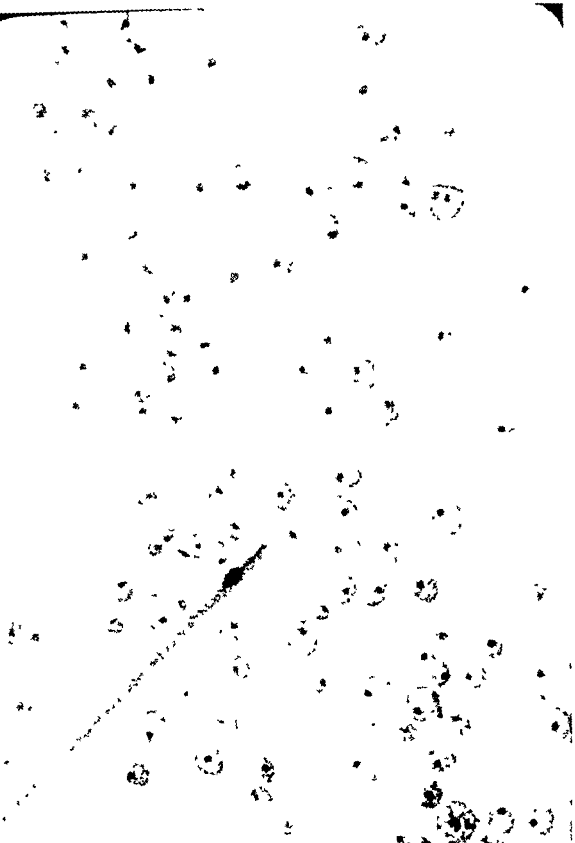

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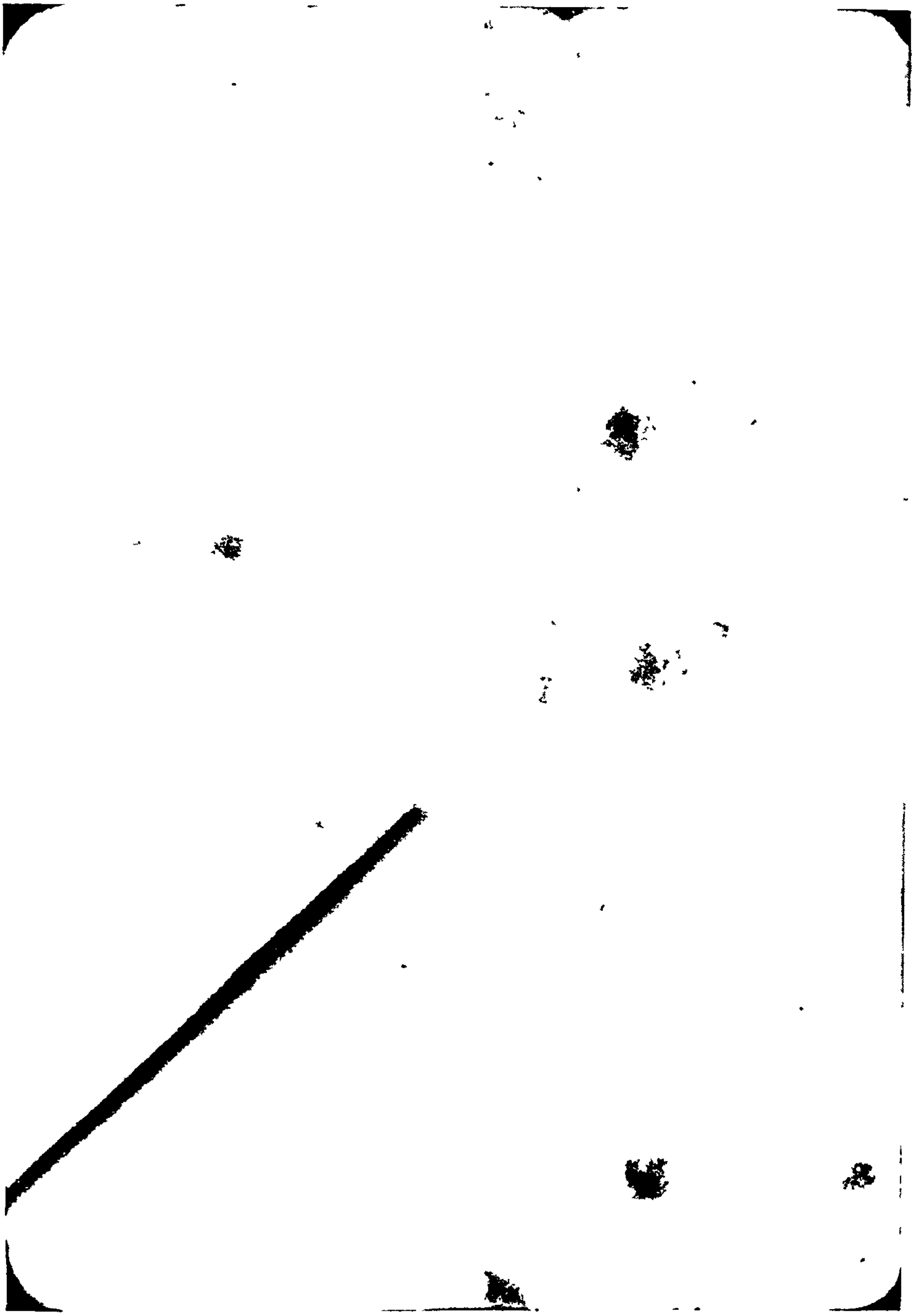

Fig. 2.—Same as Figure 1 but higher power (× 440). Hematoxylin and eosin stain.

development of definite tumors, that is, cysts, fibroadenomas, 1 papilloma and 1 early carcinoma. With this test we have detected definite pathologic lesions which otherwise would not have been discovered, even by the most careful physical examination of the breast. Our primary purpose, however, is to discover the papilloma early, before it manifests itself as a palpable tumor mass or is suggested by a bleeding nipple. With this test we were able to detect the presence of a silent papilloma in 46 per cent of the cases by cytologic examination of the secretion be-

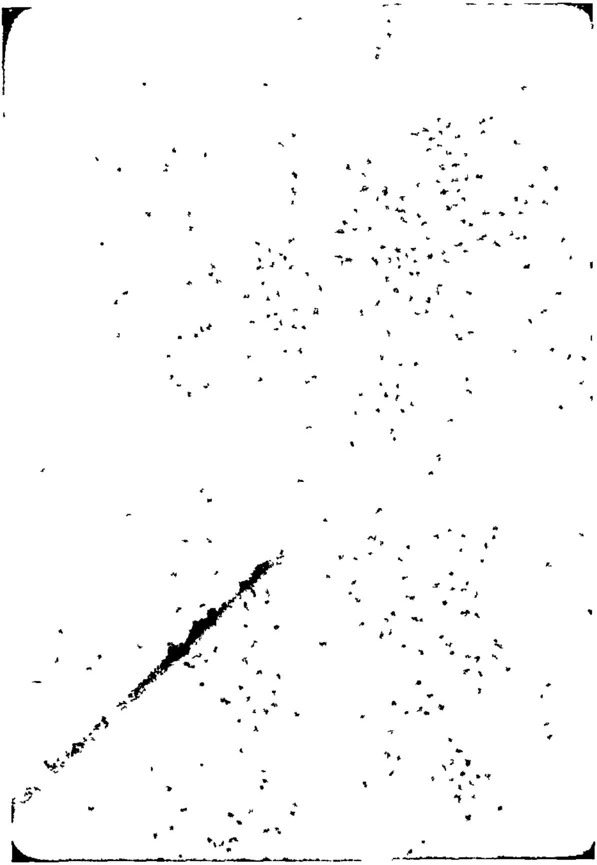

Fig 3.—Adherent clusters of cells exfoliated from areas of hyperplasia. Hematoxylin and eosin stain; × 160.

fore visible bleeding had occurred at all.

Our greatest responsibility lay in telling 2,109 women that there was no demonstrable disease in the breast. This cytologic study of breast secretions gives us greater confidence when it becomes necessary to make this serious statement.

Early in our work we had considerable difficulty in distinguishing between the normal and the abnormal exfoliative cell, and, later, in differentiating the true papilloma and the closely related epithelial hyperplasia. We believe that this difficulty now has been overcome.

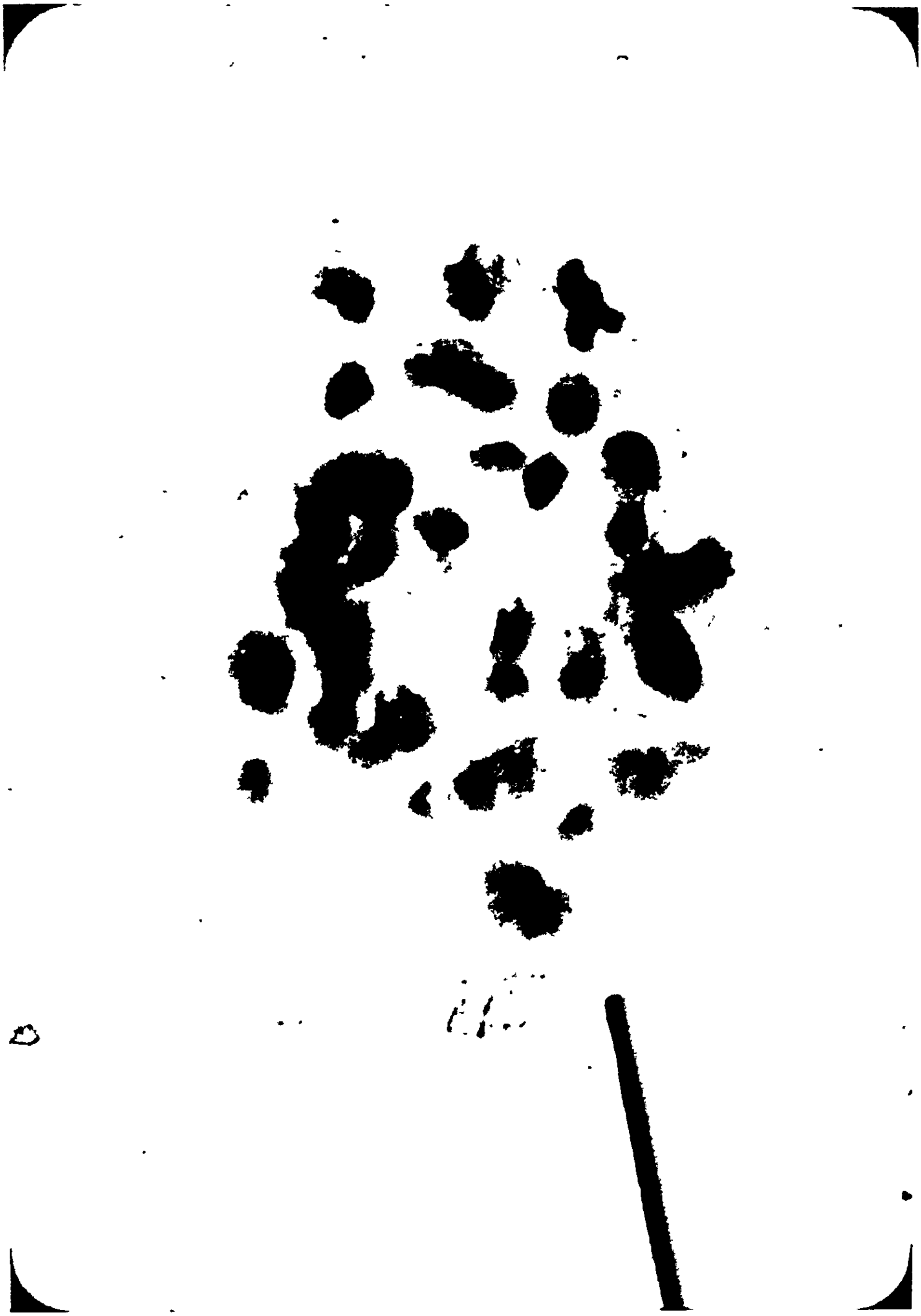

Fig. 4.—Same as Figure 3 but higher power (× 440). Note small size but generally uniform shape of cells. Cells loosely adherent; nuclei large in ratio to total cell volume. Hematoxylin and eosin stain.

A bleeding nipple has long been recognized as a danger signal of mammary disease, usually being considered due to an intraductal papilloma or carcinoma. It is an untrustworthy sign and must not be placed in the dangerous category of conditions to be handled by "watchful waiting." We have found that the bleeding nipple is only a fortunate accident, in that it calls the patient's attention to the presence of a pathologic condition in the breast. Our experience confirms the opin-

Fig. 5 —Branching stalk or frond from benign papilloma. Classic pattern. Hematoxylin and eosin stain; × 160.

ion of Howard K. Gray of the Mayo Clinic and Herbert C. Chase of New York, that in many instances malignant change has already occurred when bleeding becomes visible. On the basis of our cytologic studies and microscopic examinations, we feel that cancer frequently develops at the base of a papilloma, or in close proximity thereto, without any demonstrable symptoms or signs. Our technic is a method of detecting these papilloma before bleeding is evident and probably be[illegible] e m[illegible]nant change occurs.

Cancer seldom develo

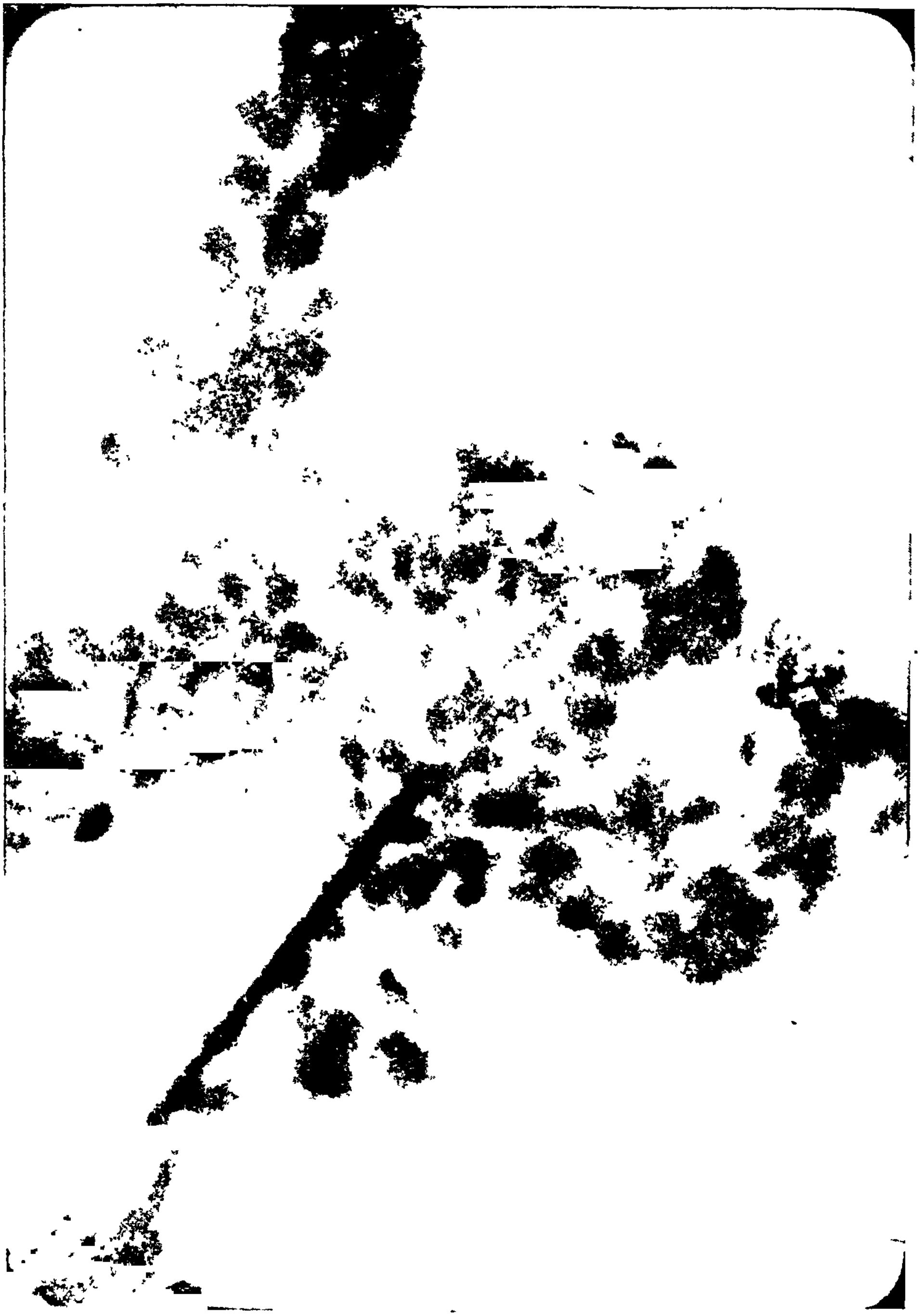

Fig. 6.—Papillomatous cluster of fronds. Classic pattern. Hematoxylin and eosin stain; × 160.

skin or mucous membrane without preexisting epithelial hyperkeratosis or leukoplakia. It is a well established fact that cancer frequently develops at the bases of polyps of the colon and papillomas of the bladder. To us it seems equally certain that cancer is more likely to develop in a breast where epithelial hyperplasia or papilloma are present than in a completely normal breast.

Four hundred and forty microscopically proved carcinomas of the breast operated

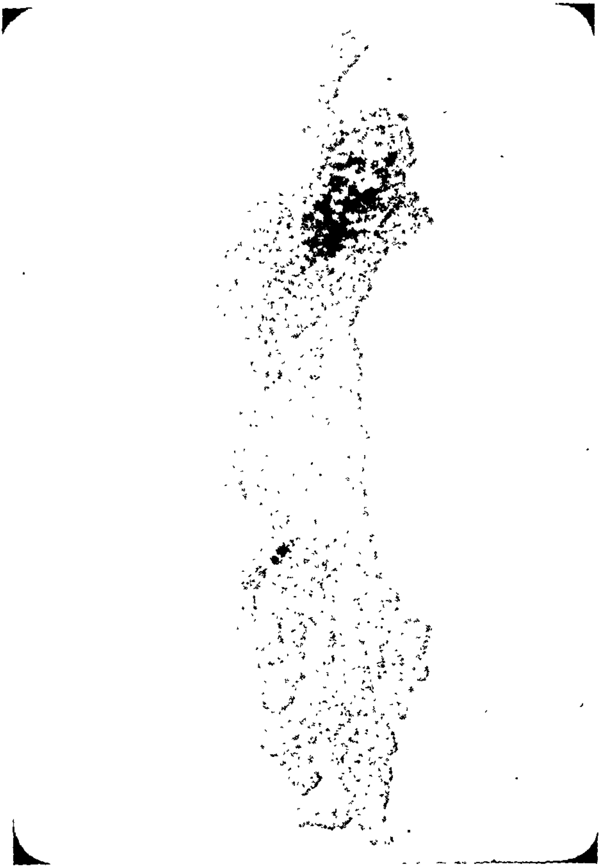

Fig. 7.—Large papillomatous cluster. Hematoxylin and eosin stain; × 160.

on by the senior author during the last seven years are being studied; 189 consecutive cases in this series have been statistically reviewed and in this group there were 66 coexistent intraductal papillomas or papillary cystadenomas.

In a series of 365 mammary papillomas reviewed by Arthur Purdy Stout and Jim Phillips, including all tumors diagnosed as papillomas in the Presbyterian Hospital from 1916 to 1941, there were 129 instances of coexistent cancer. This is an astonishing and alarming proportion and speaks for the seriousness of the disease

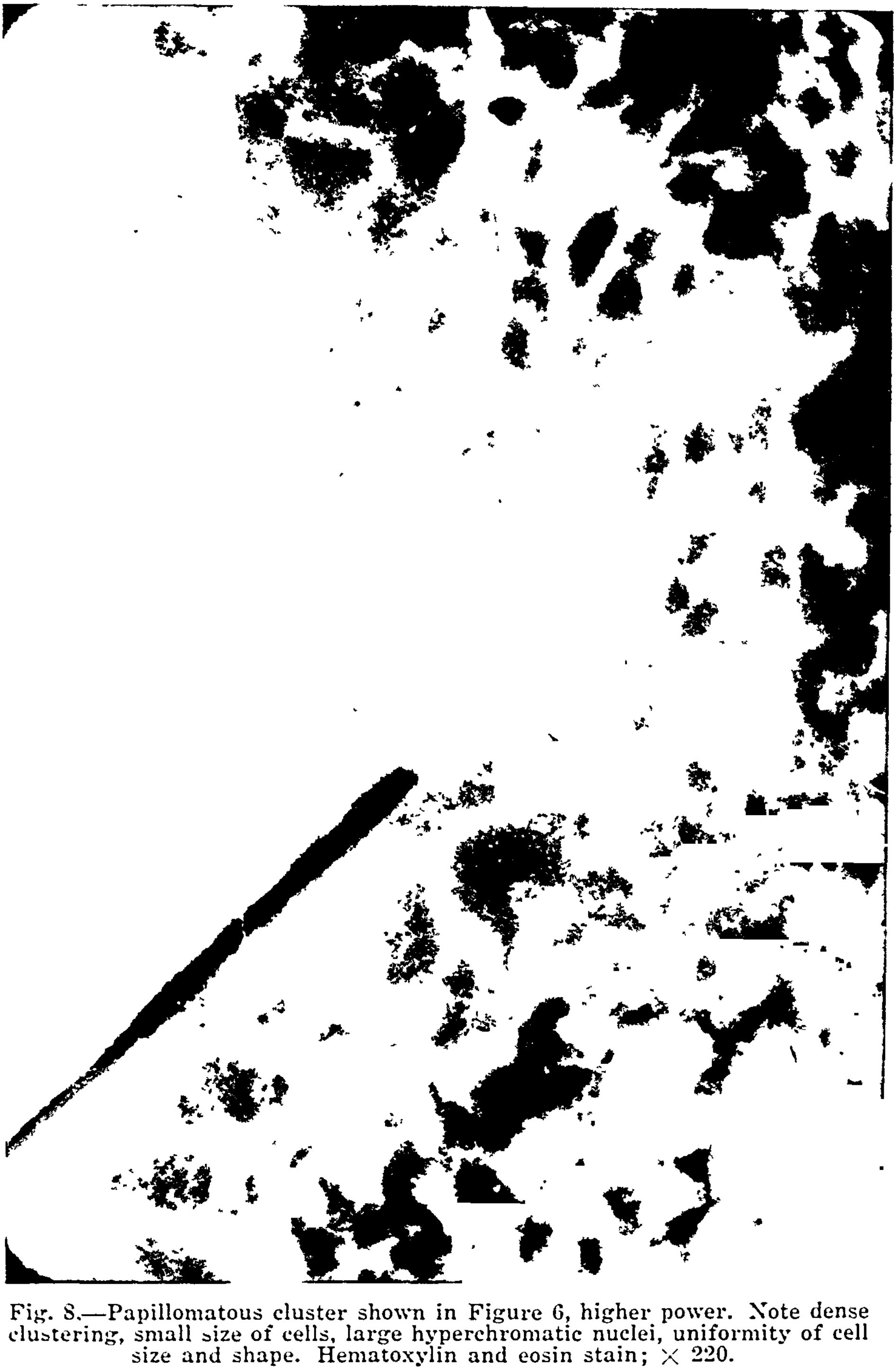

Fig. 8.—Papillomatous cluster shown in Figure 6, higher power. Note dense clustering, small size of cells, large hyperchromatic nuclei, uniformity of cell size and shape. Hematoxylin and eosin stain; × 220.

and the necessity of its early recognition.

A letter has been received from Dr. Rupert Willis, pathologist at the Royal Cancer Hospital in London, concerning this problem. We quote: "With regard to the malignant potentiality of breast papilloma, my view is very similar to that explained in Cheatle and Cutler's book, namely, that while there do occur quite localized simple papillomas in the larger ducts which can be removed successfully and do not recur, it is more frequent to

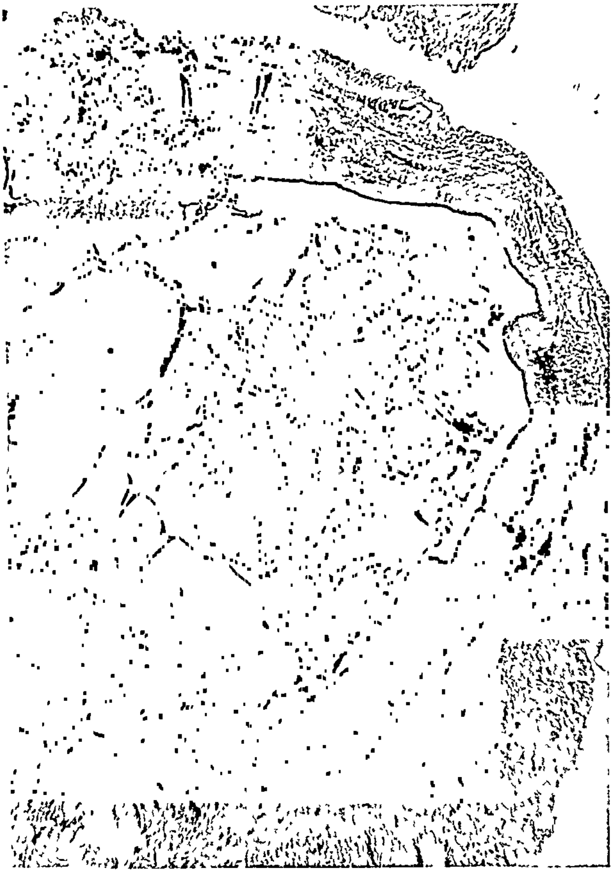

Fig. 9.—Section of duct showing papilloma in situ, × 50.

(AUTHOR'S NOTE: *This photomicrograph and the three to follow, Figures 10, 11 and 12, are presented in association with Dr. C. M. Pomerat, Professor of Cytology, University of Texas, Medical Branch, Galveston. The National Cancer Institute has made available a grant to continue this investigation, in collaboration with Dr. Pomerat. The four photomicrographs show low and high powered views of the histologic structures of the papilloma from which these tissue cultures were obtained. Illustrations 11 and 12 show the growth of the papilloma in tissue culture*).

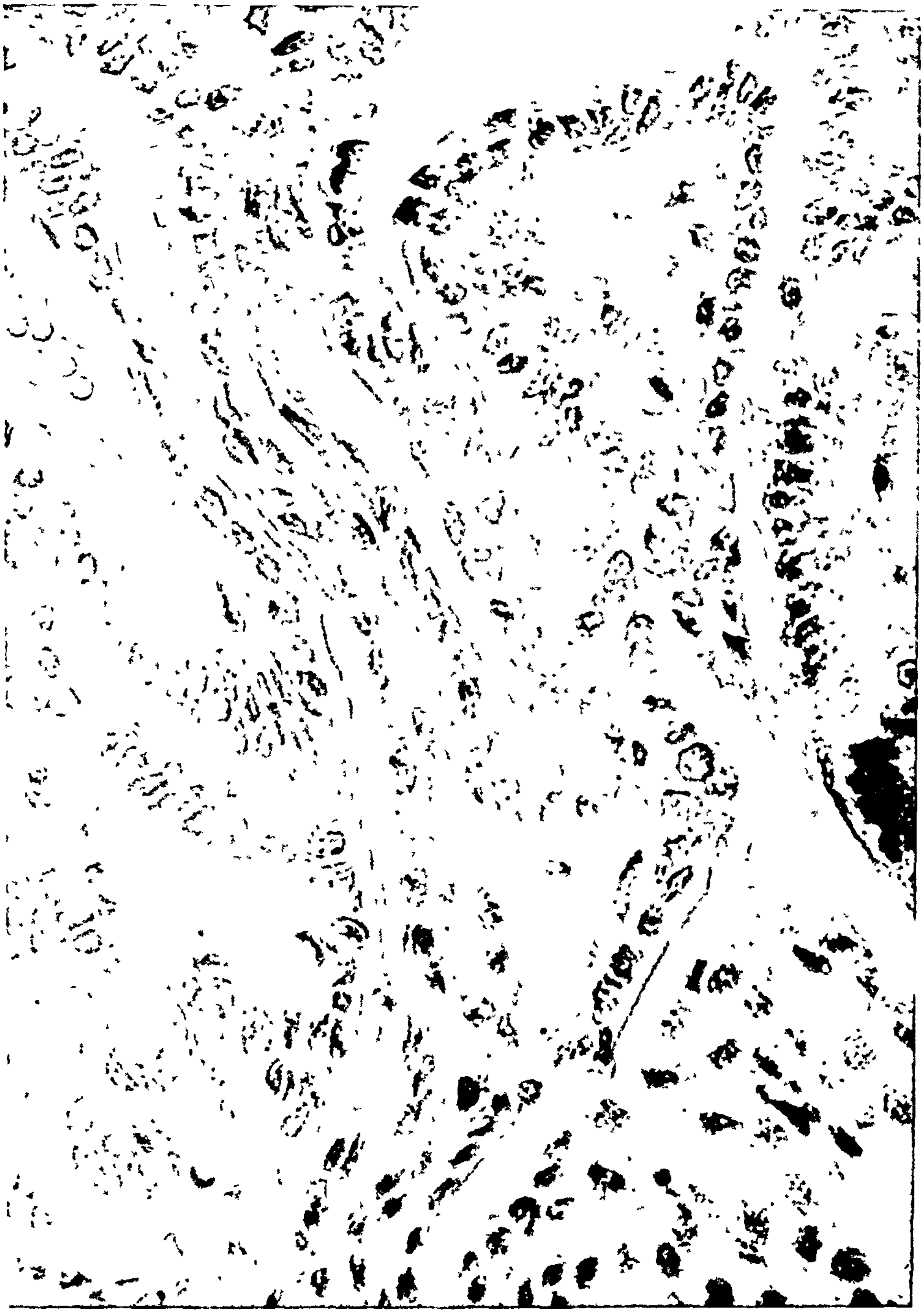

Fig. 10.—Appearance of papilloma shown in Figure 9 in histologic section; × 500.

encounter multiple papillary growths involving the ducts over a considerable extent, and these are prone to evolve into intraductal cancer which eventually becomes infiltrative. There is little doubt, I think, that most papillary growths in the breast, as in most other situations, are a stage in the evolution of malignancy and should be treated as such."

The simple expression of secretion from a nipple does not, in any way, traumatize cancer some distance from the nipple. It is conceivable that an intraductal carcinoma of the nipple, or the lesions of

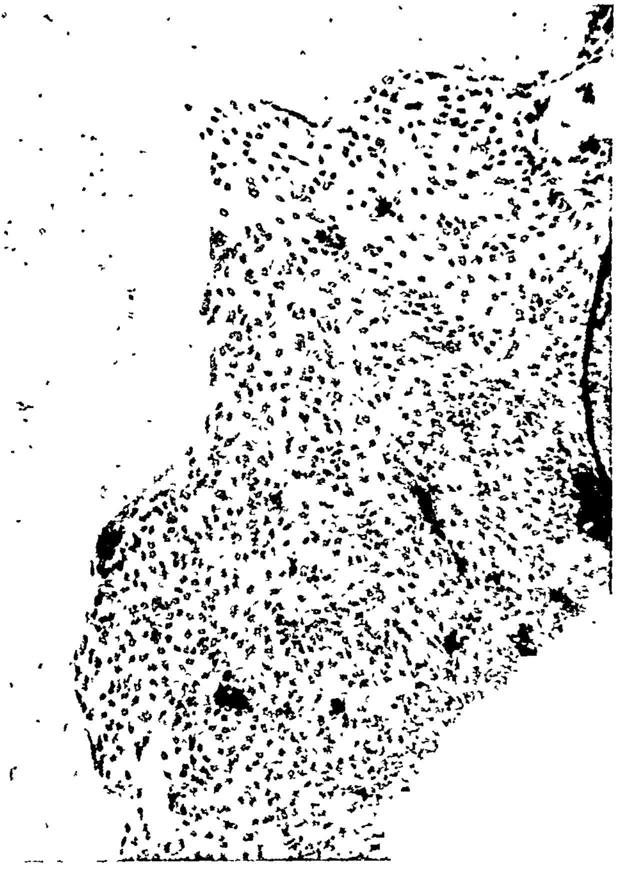

Fig 11—Sheet of epithelial cells growing from an explant of papillomatous tissue after twelve days of incubation. Stained with Jacobson's (May-Grunwald Giemsa) combination; × 100.

Paget's disease, could be traumatized; but in these cases the nipple is rigid, indurated or retracted, mechanically preventing one from traumatizing the lesion. As a matter of fact, in most breast carcinomas the duct system is so involved in the disease, even when the lesion is located in the periphery, that this secretion is unobtainable.

The surgical treatment we use for papil-

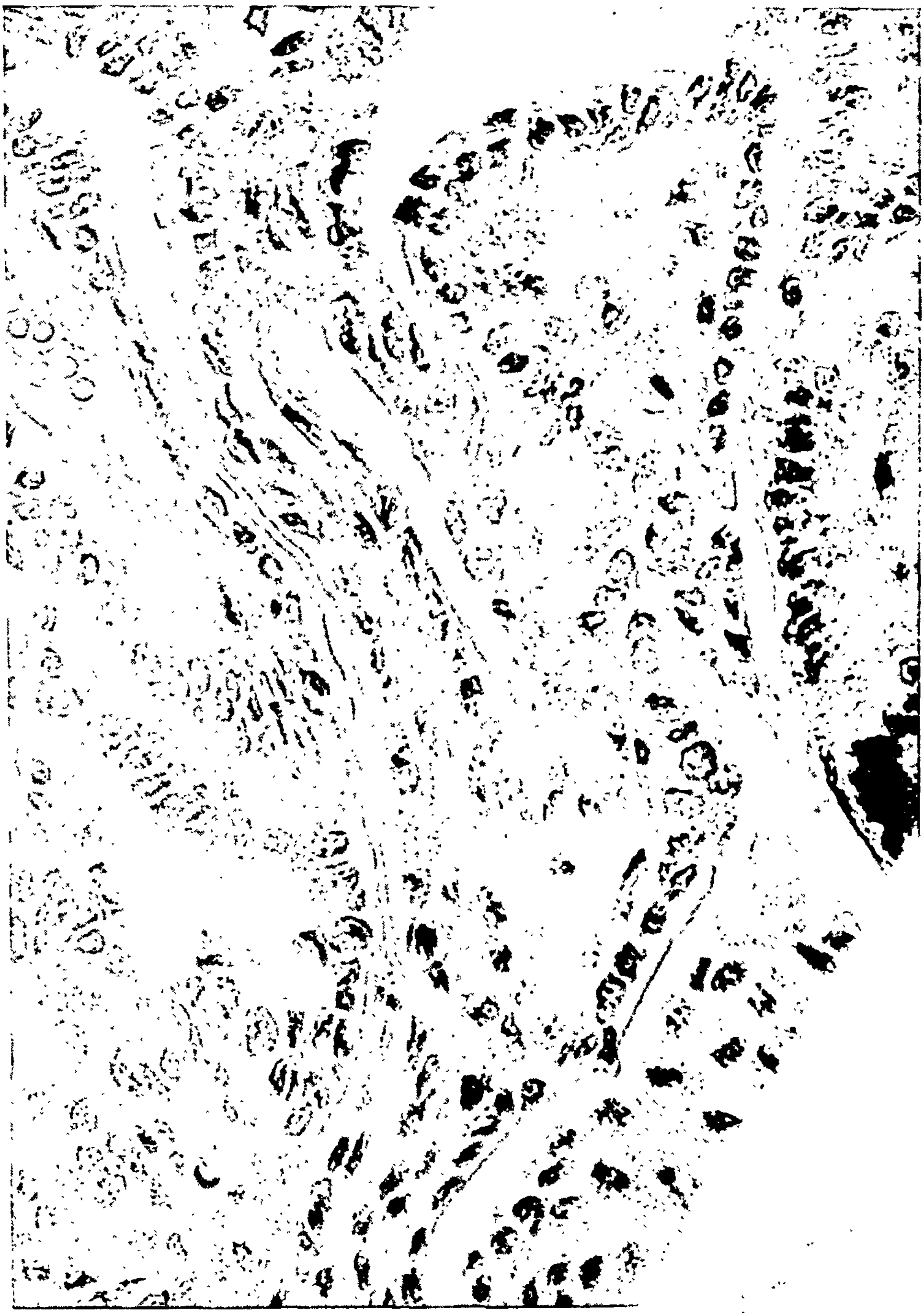

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Fig. 13 —Photograph showing normal pearl-colored fluid

port will include the results of these two studies.

SUMMARY AND CONCLUSIONS

1 A method is described by which a silent papilloma, often a premalignant lesion, can be discovered before the classic sign of the bleeding nipple is present.

2. Excessive intraductal epithelial hyperplasia is also detectable, and is considered by the authors a sign of future pathologic change in the breast.

3. No examination of the breast is complete without a thorough cytologic study of the mammary secretion.

4. If it is granted that a papilloma is often a premalignant lesion and should be removed, a method to detect the silent papilloma before it bleeds, or is suspected for any other reason, justifies this study.

RÉSUMÉ

1. Une méthode est decrite par laquelle un papillome silencieux qui est souvent une lésion prémaligne peut être reconnu avant que le signe classique d'hemorrhagie due mamelon soit présent.

2. Une hyperplasie épithéliale intraductale excessive peut aussi être reconnue et est considerée par les auteurs un signe de pathologie future du sein.

3. Aucune examen du sein n'est complet sans une étude cytologique à fond de la sécretion mammaire.

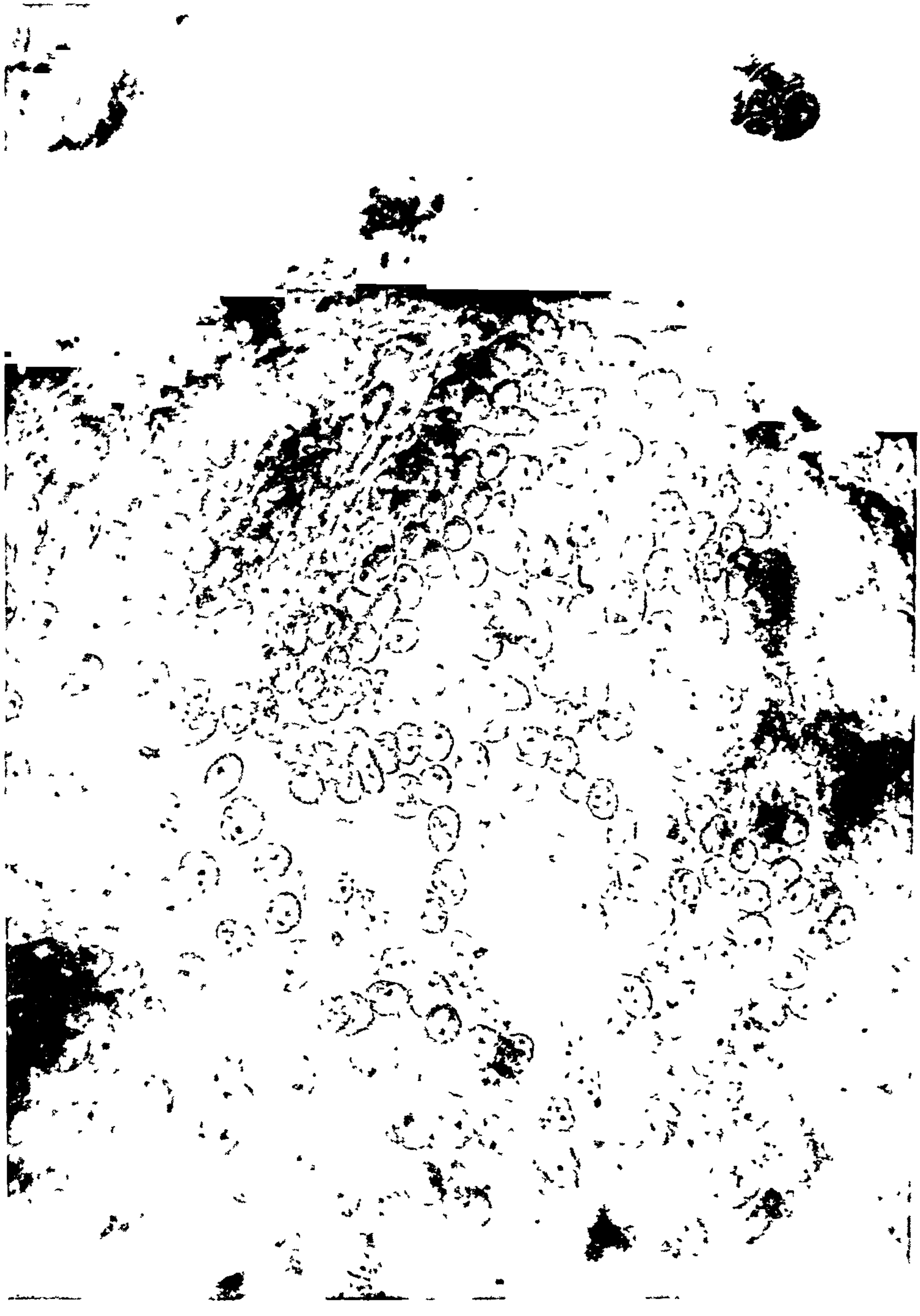

Fig. 12.—Outgrowth of epithelial cells from papillomatous explant, × 500. Note uniform size and characteristics of nuclei at junction of epithelial sheet with explant (solid black mass).

loma consists of a wedge-shaped quadrant resection with complete and exceedingly careful excision of the interior of the nipple.

At present we are also studying secretions obtained from a group of normal young women. Smears are taken three times a week and the cellular observations correlated with their menstrual cycles. Dr. C. W. Pomerat, at the University of Texas, is making tissue cultures of breast secretions from the same group. A future re-

deckt werden. Dieser Zustand wird von den Verfassern als ein Anzeichen spaeterer Krankheitsveraenderungen in der Brust angesehen.

3. Keine Untersuchung der Brust is vollstaendig ohne ein sorfaeltiges zytologisches Studium der Brustdruesensekretion.

4. Wenn anerkannt wird, dass ein Papillom haeufig eine praemaligne Erkrankung darstellt und entfernt werden sollte, dann erscheint diese Arbeit, die eine Methode zur Entdeckung eines ruhenden Papilloms vor Auftreten einer Blutung oder beim Vorliegen irgendwelcher Verdachtsmomente angibt, gerechtfertigt.

RESUMEN Y CONCLUSIONES

1. Se describe un método por el que un papiloma asintomático, frecuentemente una lesión precancerosa, puede descubrirse antes de presentarse el signo clásico del pezón sangrante.

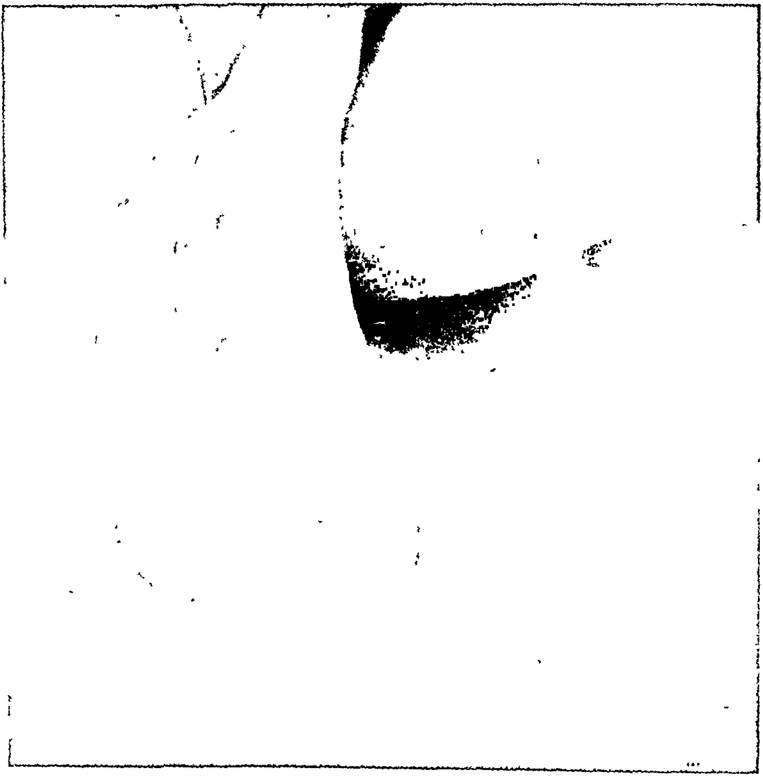

Fig. 15.—Photograph showing straw-colored fluid from papilloma.

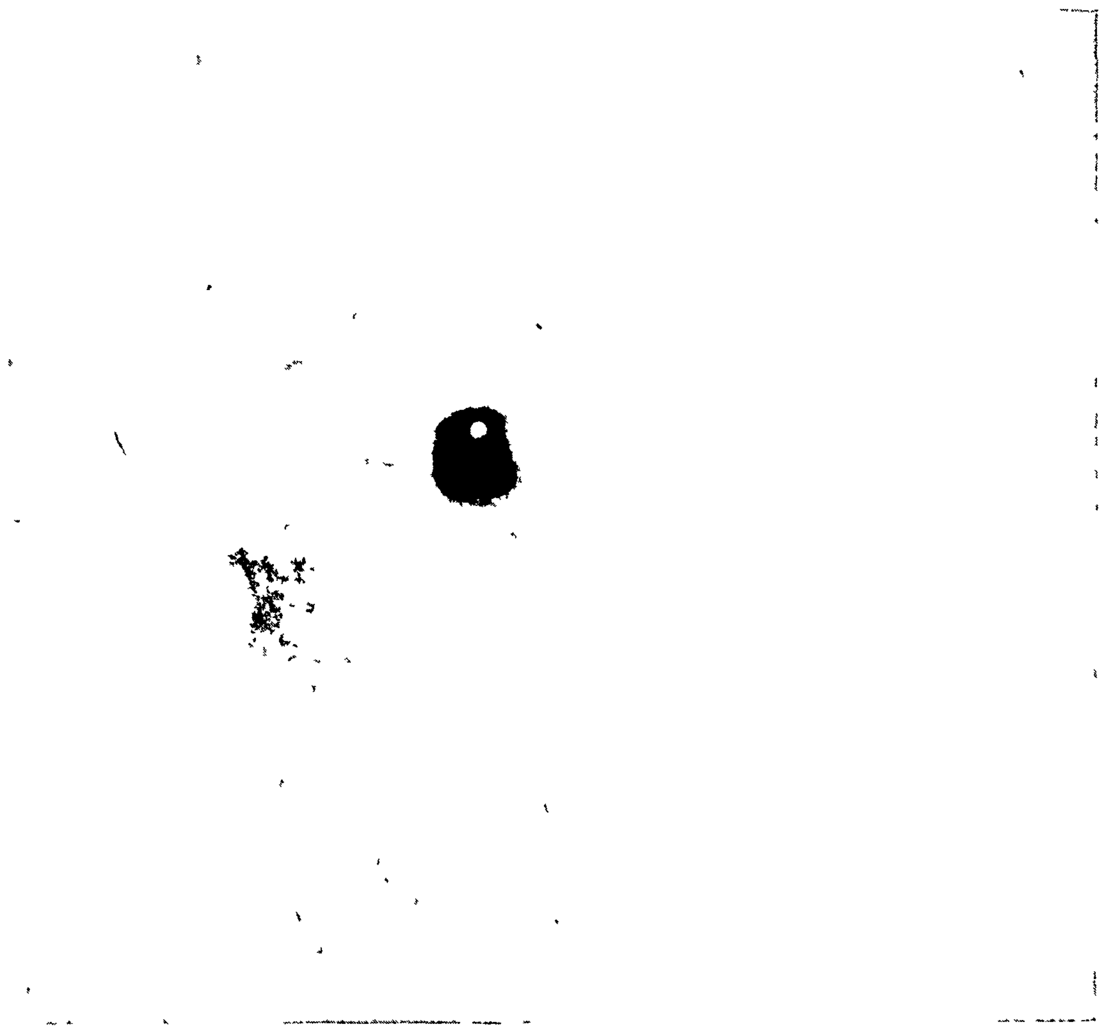

Fig. 14.—Photograph showing bloody fluid, usually diagnostic of papilloma.

4. Vu qu'un papillome est souvent une lesion prémaligne et doit être enlevé, une methode pour reconnaitre le papillome silencieux avant qu'il saigne, ou s'il est soupconne pour d'autres raisons justifie cette étude.

RIASSUNTO

1. Descrivono un metodo capace di rivelare la presenza di un papilloma prima della comparsa del sintomo classico, cioe' una secrezione ematica dal capezzolo.
2. Questo metodo consente la scoperta di un'eccessiva iperplasia epiteliale nei dotti galattofori: iperplasia che gli AA. ritengono la prima fase di ulteriori e piu' gravi lesioni neoplastiche della mammella.
3. L'esame della mammella non e' naturalmente completo senza un accurato esame microscopico della secrezione mammaria.
4. Questo nuovo metodo deriva la sua importanza dal fatto che i papillomi rappresentano spesso un'affezione precancerosa e vanno—come tali—sempre asportati.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Eine Methode zur Entdeckung ruhender Papillome (einer haeufig praemalignen Erkrankung) vor dem Auftreten des klassischen Zeichens der blutenden Brustwarze wird beschrieben.
2. Auch uebermaessige Hyperplasie des Epithels der Druessengaenge kann ent-

Endocrine Therapy in Gynecologic Practice

JACOB KOTZ, M.D., F.A.C.S., F.I.C.S.* AND MORTON S. KAUFMAN, M.D.**
WASHINGTON, D. C.

TWO decades ago a discussion of the endocrine treatment of menstrual disorders would have been necessarily brief, as the only endocrine products available for treatment were thyroid, ovarian and corpus luteum tablets.

The treatment of amenorrhea in those days was a simple matter; the patient was told that to menstruate was not important and to forget it. The patient with dysmenorrhea was advised to get married and, if married life did not relieve the menstrual cramps, she was told to get pregnant.

The treatment of sterility in the female was equally simple. First, a dilatation and curettement was done. If after several months pregnancy did not follow, another was advised. I have seen patients who had had as many as ten such operations. Finally, a laparotomy was recommended.

In 1950 we are still floundering in our treatment of functional disorders, but the science of endocrinology has moved along steadily. Highly potent preparations are available and if not properly used can be harmful. We must therefore learn not only when to use them but when not to use them.

Functional Bleeding. — Perhaps the most common functional complaint encountered by the gynecologist is functional uterine bleeding. In the past the treatment was quite simple. It consisted of the use of ergot; next came radium, and finally operation.

Today the management of the patient with functional bleeding is by no means a simple problem. Many potent endocrine products are available, but even with their aid one is sometimes forced to resort to radium or surgical intervention.

Practically, there are two types of functional bleeding: (*1*) excessive regular flow and (*2*) too frequent and prolonged flow.

In selecting a plan of treatment, the age of the patient should be considered. In the management of bleeding both in puberty and in maturity it is important to conserve the reproductive functions. Bleeding in a woman past the childbearing age is usually approached by a preliminary curettage to rule out malignant disease and then treated by the intrauterine application of radium. However, hysterectomy is preferable to radium when interpretation of the microscopic examination is in doubt or when there appears some other indication for laparotomy.

The management of bleeding in puberty and in maturity can, for the purpose of our discussion, be divided into two parts: (1) control of bleeding when the patient is first seen, and (2) prevention of recurrence.

Many methods have been used to meet both indications, but no single agent is effective in every instance of functional bleeding. When the bleeding is so great as to exsanguinate the patient, one or more transfusions followed by curettage are in order. When the condition is good, one can afford to take sufficient time to examine the patient thoroughly. This should include vaginal cytologic study, basal metabolism test, complete blood count, etc. Malignant disease should be ruled out, irrespective of the patient's age. It may not always be possible to hospitalize the patient for curettage; thus valuable time may be lost. The vaginal smear technic offers a rapid and simple method for ruling out malignancy. It should not take the place of cervical or endometrial

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2. La hiperplasia epitelial intracanalicular excesiva es también revelable, siendo considerada por los autores como signo de mutación patológica futura en la mama.
3. Ningún examen de la mama es completo sin estudio citológico completo de la secreción mamaria.
4. Si se acepta que un papiloma es frecuentemente una lesión precancerosa y se extirparía, un método para descubrir el papiloma asintomático antes de sangrar, o sospechado por cualquier motivo, justifica este estudio.

SUMÁRIO

1. Descreve-se um método pelo qual o papiloma silencioso, muitas vezes uma lesão premaligna, póde ser descoberto antes que o signal classico de mamilo sangrante seja observado.
2. Excessiva hiperplasia epitelial e intraductal é igualmente destacavel e é considerada pelos autores como um sinal de futuras alterações patológicas nas mamas.
3. Nenhum exame dos seios é satisfatorio sem uma análise citologica da secreção mamaria.
4. Si admitirmos que o papiloma é muitas vezes uma lésão pre-maligna e que deva ser removido, um método para descobrir o papiloma silencioso antes que ele sangre ou que seja suspeitado por qualquer outra razão justifica seu estudo.

Announcement

International Board of Occupational Surgery

The Executive Council of the United States Chapter and the Board of Trustees of the International College of Surgeons have unanimously approved the formation of an International Board of Occupational Surgery, the aims of which are (*a*) elevation of standards for the practice of occupational surgery, (*b*) conservation of the health of the worker after occupational injury, (*c*) official recognition of this specialty, (*d*) stimulation of interest in this field by students and members of the profession, and (*e*) cooperation in the establishment of facilities for graduate education in occupational surgery by means of residencies in hospitals affiliated with medical schools, or their equivalents.

Frederick W. Slobe, M.D., F.A.C.S., F.I.C.S., Chairman

E. C. Holmblad, M.D., F.A.C.S., Secretary

For further details, address Dr. Arnold S. Jackson, Secretary, United States Chapter, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10, Illinois.

small doses their effects are transitory, and the probability of masculinizing effects is negligible

There are some who believe that the androgens are not physiologic and should not be used, nevertheless, in our hands, the results obtained with testosterone have been gratifying One should, of course, be on the lookout for any unpleasant side effects The androgens should be avoided for women who already have a tendency to hirsutism The dysmenorrhea of endometriosis, however, may be controlled by androgen therapy in many cases

Thyroid Extract Thyroid extract should be used in all cases of dysmenorrhea when the basal metabolic rate is on the minus side We have obtained very encouraging results in cases of dysmenorrhea associated with malnutrition by using 10 units of insulin daily throughout the cycle and by using thiamin chloride in 100 mg doses once daily The insulin and thiamin can be combined in suitable cases with the estrogens or the androgens

Amenorrhea—Like all female functional disorders, amenorrhea is merely a symptom, usually the most outstanding symptom as far as the patient is concerned, of either a local or a constitutional disorder

It may be primary or secondary, functional or physiologic In all cases of amenorrhea, the condition is due to some dis turbance in the pituitary-gonadouterine relationship which prevents the consummation of the normal cyclic changes in the endometrium

Amenorrhea occurs in hypohormonal conditions in which the anterior pituitary fails to secrete an adequate amount of gonadotropic hormone, or in which the ovary is unresponsive to pituitary stimulation Amenorrhea may also be seen in hyperhormonal states such as pregnancy, persistent corpus luteum cysts and granulosa cell tumors

Amenorrhea may be a symptom of various metabolic disturbances associated with thyroid disease, diabetes, obesity, malnutrition, or nervous and psychopathic disturbances Emotional shock was responsible for many cases of amenorrhea in wartorn Europe, and nutrition played an important part Amenorrhea is frequently seen in young women after excessive dieting, because the ovaries are sensitive to nutritional deficiencies Some of the women in concentration camps had amenorrhea for a period varying from six months to a year, others for the entire duration of their internment

The treatment of amenorrhea may be divided into nutritional, endocrine, radiation and surgical Irrespective of the underlying endocrine or metabolic causes, one must eliminate foci of infection Obesity must receive appropriate attention, and the undernourished should have a high caloric diet with insulin in 10-unit daily doses Thyroid should be given in small doses to bring the basal metabolic rate to plus 10 to plus 15 A change of environment, when possible, is helpful

The endocrine treatment of amenorrhea is far from satisfactory For many years we have used roentgen treatment to the pituitary and ovaries, treatments being given at weekly or three-week intervals for a total of three treatments Kaplan treated 142 women, in 124 patients the menstrual cycle was reestablished, 52 of these women conceived and 50 had normal babies Seventy-two per cent of Mazer's patients menstruated after radiation therapy, and 54 per cent of the sterile patients in this series were delivered of healthy babies Now and then the roentgen treatment had to be repeated

In the past few years, we have combined radiation therapy with various endocrine preparations When an ovarian pathologic condition, such as tumor or cyst is present, conservative surgical methods are indicated to remove the cause of the amenorrhea and permit the remaining ovarian tissue to function normally

It is not necessary to institute endocrine therapy before a girl reaches the age of seventeen Without treatment most of these patients usually become essentially normal biopsy, but it is of tremendous diagnostic value.

The vaginal smear technic is also of value in determining the choice of hormones to be used. If the vaginal cornification count is high, androgen by itself or in combination with progesterone is the treatment of choice. We use 25 mg. of testosterone with 25 mg. of progesterone, parenterally, daily for 3 to 7 doses. The patient is cautioned that two to four days later there will be a recurrence of bleeding, which will last for three to four days and then stop either suddenly or gradually.

Our endocrine treatment from this point consists in the use of testosterone proprionate in 25 mg. doses with 10 mg. of progesterone daily for the first three to four days of the next three or four periods.

When the cornification count is low we use 5 to 10 mg. of estrone sulfate (premarin) daily for twenty days. This is followed by 50 to 100 mg. of progesterone linguets daily for ten days. If bleeding occurs during treatment the drug is discontinued, but the estrone sulfate is resumed on the fourth or fifth day of bleeding. This treatment is continued for about three to four cycles. An endometrial biopsy is done on the first day of the fourth cycle, and if secretory endometrium is found treatment is discontinued.

Should the cornification count be normal, progesterone is the medicament of choice. Twenty-five to fifty mg. of progesterone in sesame oil is given every day until bleeding is controlled. Here again, when therapy is withdrawn the patient will bleed for several days, and a sort of medical curettage takes place. In an effort to regulate the cycle, 50 to 100 mg. of progesterone, given buccally or sublingually, should be administered daily for three to five days during at least three to four succeeding periods.

One should not be too hasty in condemning the endocrines. Subminimal pathologic change is often present which cannot be ruled out by the usual pelvic examination.

Gonadotropins have proved disappointing in the treatment of functional bleeding. Only a small percentage will respond to such therapy. Once the immediate attack is under control, attention should be given to the general condition of the patient. Thyroid therapy should be given whenever the basal metabolic rate is on the minus side. It has been our custom for years to give enough thyroid to maintain the basal metabolism rate at plus 10 to plus 15 in the management of all functional problems in women. Correction of body weight in the obese and the underweight should receive prompt attention; foci of infection should be corrected.

Dysmenorrhea. — Almost every endocrine product available for clinical use has been tried in the treatment of dysmenorrhea. Many have been used indiscriminately, with varying results. But even when due care has been given to the selection of cases and when application has been made of the seemingly appropriate glandular therapy, no one product has been eminently successful in all cases. This should not be too discouraging but should serve to emphasize the fact that there is no one cure for dysmenorrhea and that treatment of each patient must be highly individualized, the problem being attacked from every possible etiologic angle.

Estrogen: Everyone will agree that dysmenorrhea is a disorder of ovulating women and that it is considerably relieved by preventing ovulation. This can probably be accomplished by giving 5 mg. of estrone sulfate (premarin), starting as soon as the period is over and continuing until about the twenty-third day of the cycle. One must bear in mind that this therapy cannot be used for patients who desire to become pregnant. In such cases, we use the androgens. They depress the pituitary and counteract the effects of estrogen.

The dosage and the time of administration have varied widely with different authors. In our experience large doses are not necessary; 10 to 20 mg. given daily by the peroral route during the last phase of the cycle is sufficient. In such recommended progestin therapy Greenhill and Fried held that the condition was the result of sodium ion retention by the different tissues of the body under the influence of ovarian steroids They recommended reduction of salt in the last two weeks of the cycle, plus the administration of ammonium chloride Hudgins recommended the use of thyroid Many have advised the use of Vitamin B, and Cline advised the use of methyl testosterone given once daily for seven to ten days before the onset of menstruation Novak recommended abolishing menstruation by using radium for patients nearing the menopause

All doctors see patients whose symptoms are mild and can be controlled by sedatives and laxatives It is certainly less expensive than the use of androgens and less troublesome than ammonium chloride and a salt-free diet On the other hand, for severe symptoms, testosterone, administered buccally or sublingually in 10 mg to 20 mg daily doses, starting *about one week before the expected period*, will be helpful, and for patients near the menopause roentgen or radium castration will be effective

Midmenstrual Pain and Midmenstrual Bleeding—Midmenstrual pain and midmenstrual bleeding are encountered at reasonably frequent intervals by the gynecologist Rock has stated that fewer than 5 per cent of all women have sufficient bleeding at the time of ovulation to attract their attention Papanicolaou observed red blood cells in vaginal smears from 24 per cent of normal menstruating women about the time of ovulation In the majority of patients with pain and bleeding at the midperiod the symptoms are so mild that no treatment is required Now and then one sees a patient with symptoms so severe that appendicitis or ectopic pregnancy must be ruled out Occasionally, surgical intervention is necessary because of a massive hemorrhage At times one sees a patient who is quite apprehensive because of the midmenstrual bleeding, even though the amount of blood lost is small

The etiologic aspects of these symptoms are not understood Those, however, not due to infection will respond to androgenic therapy of 10 mg a day, administered buccally or sublingually during the cycle for three to four months A second or even a third course of androgenic therapy may be necessary

Chronic Cystic Mastitis—Another common complaint is pain in the breasts, which occurs in cyclic women about one week to ten days prior to the onset of the menstrual period When the pain is limited to a few days before the period it is called mastalgia or mastodynia Adenosis or mazoplasia is the name given to this condition when the pain becomes chronic and is present throughout the cycle and when the breasts become nodular

Both conditions have their origin as a result of disharmony of the pituitary and ovarian mechanism In both there is a deficiency in progesterone production as indicated by the amount of pregnandiol found in the urine, which is 11 6 mg per *cycle as compared to 39 1 mg for controls*

Treatment of Mastodynia and Adenosis In many cases the discomfort produced by both of these conditions is mild and therefore requires no treatment, but should the patient be apprehensive or should the discomfort produced be sufficient to require treatment, the following therapy may be instituted The estrogens have been found to be of value in some cases on the basis that they inhibit hypophyseal hyperactivity Mazer has stated that the estrogens proved effective in 61 5 per cent of his cases

In some cases, however, the condition is aggravated by the estrogens Since it has been demonstrated that there exists a deficiency of progesterone, it seems to us that progesterone is the medicament of choice—5 to 10 mg administered parenterally every other day during the last half of the cycle, or the buccal or sublingual route can be used, 25 to 50 mg per day being given for two consecutive periods Geschickter, following this schedule, obtained relief which lasted twelve to eighteen months in most of his 27 cases

The longer the period of amenorrhea, the poorer the results with any type of treatment.

In the hypohormonal states, a sufficient amount of estrogen therapy will induce uterine bleeding, but making a nonovulating women ovulate is quite a different problem.

Zondek's method of treating amenorrhea is as follows: (a) for secondary amenorrhea of two years or less in duration, the patient receives 2.5 mg. of estradial benzoate and 12.5 mg. of progesterone on two successive days; (b) for secondary amenorrhea of more than two years' duration, five daily injections of 10 mg. of progesterone are given; (c) for primary amenorrhea, 1 mg. of estradial benzoate and 10 mg. of progesterone are given daily for five days. Uterine bleeding from an estrogen endometrium follows in a few days. A second and third course of injections is given on the same dates during the following two months.

The Kaufman method consists of giving the patient 2 mg. of diethylstilbestrol or 2.5 mg. of estrone sulfate daily for fifteen days, followed by 60 mg. of pranone (progesterol lutocylol) daily for five days. This course is repeated for three consecutive months, beginning with the cessation of each induced menstrual flow.

The advantage of the Kaufman over the Zondek method is that the patient bleeds from a premenstrual type of endometrium. It should be remembered that the usual patient with amenorrhea has average health but suffers psychically from the impression that all is not well. Therefore, if only the amenorrhea is treated, we prefer the Zondek method, as it brings about results in a shorter time. On the other hand, if the goal is pregnancy, the Kaufman method is preferable.

The therapy, therefore, of secondary amenorrhea is essentially the treatment of the underlying infection, of the organic and metabolic disorder rather than the amenorrhea itself. Thus far, the results obtained with gonadotrophin have been disappointing, primarily because no gonadotrophic preparations are as yet available which are of undoubted efficacy in the human being.

We have employed estrogenic therapy alone or in combination with thyroid in cases of amenorrhea associated with hypoplasia. Here it is our aim to increase the size and vascularity of the uterus to such a point that it can respond to the hormones supplied by the patient's own ovaries. Two and one-half to 3.75 mg. of estrone sulfate is given for twenty days, with a ten day rest period. This program is repeated for several months, and the uterus is checked for any increase in size. This therapy, however, will be of no value when the sexual retardation involves the ovaries as well as the uterus.

In summarizing the treatment of amenorrhea, it should be remembered that one is dealing with a symptom and that treatment should attempt to correct the underlying cause. The therapeutic measures adopted for the individual patient should have a rational basis and should entail no danger to gonadal function.

Premenstrual Tension.—The term "premenstrual tension" was coined by Frank, and it describes a syndrome characterized by an exaggeration of the usual menstrual molimina to the point where they become distressing or incapacitating. For the milder forms, Greenhill and Fried have proposed the term "premenstrual distress." Although it may occur at any time during the menstrual cycle, the severe manifestations we have seen have been mostly in women approaching the menopause.

The outstanding symptoms in the presence of severe involvement are headache, vertigo, irritability, crying spells, transient edema, and occasionally nymphomania and suicidal tendencies.

Since the cause of this condition is unknown, its treatment is necessarily empirical. Frank thought the condition was due to hyperestrenemia and recommended magnesium sulfate, but for women near the menopause he advised roentgen castration. Israel suggested that the cause was a deficient production of progestin and recommended progestin therapy Greenhill and Fried held that the condition was the result of sodium ion retention by the different tissues of the body under the influence of ovarian steroids They recommended reduction of salt in the last two weeks of the cycle, plus the administration of ammonium chloride Hudgins recommended the use of thyroid Many have advised the use of Vitamin B, and Cline advised the use of methyl testosterone given once daily for seven to ten days before the onset of menstruation Novak recommended abolishing menstruation by using radium for patients nearing the menopause

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The etiologic aspects of these symptoms are not understood Those, however, not due to infection will respond to androgenic therapy of 10 mg a day, administered buccally or sublingually during the cycle for three to four months A second or even a third course of androgenic therapy may be necessary

Chronic Cystic Mastitis—Another common complaint is pain in the breasts, which occurs in cyclic women about one week to ten days prior to the onset of the menstrual period When the pain is limited to a few days before the period it is called mastalgia or mastodynia Adenosis or mazoplasia is the name given to this condition when the pain becomes chronic and is present throughout the cycle and when the breasts become nodular

Both conditions have their origin as a result of disharmony of the pituitary and ovarian mechanism In both there is a deficiency in progesterone production as indicated by the amount of pregnandiol found in the urine, which is 11 6 mg per cycle as compared to 39 1 mg for controls

Treatment of Mastodynia and Adenosis In many cases the discomfort produced by both of these conditions is mild and therefore requires no treatment, but should the patient be apprehensive or should the discomfort produced be sufficient to require treatment, the following therapy may be instituted The estrogens have been found to be of value in some cases on the basis that they inhibit hypophyseal hyperactivity Mazer has stated that the estrogens proved effective in 61 5 per cent of his cases

In some cases, however, the condition is aggravated by the estrogens Since it has been demonstrated that there exists a deficiency of progesterone, it seems to us that progesterone is the medicament of choice—5 to 10 mg administered parenterally every other day during the last half of the cycle, or the buccal or sublingual route can be used, 25 to 50 mg per day being given for two consecutive periods Geschickter, following this schedule, obtained relief which lasted twelve to eighteen months in most of his 27 cases

Recently the androgens have been used and found to be effective when other methods have failed. Morton has obtained good results with chorionic gonadotropin. He stated that 24 infertile women who had chronic cystic mastitis were relieved of their symptoms and that 8 of them subsequently became pregnant.

Although it seems clear that we do not yet have a miracle drug that will relieve chronic cystic mastitis, we have at least several drugs to choose from. For the cystic type of chronic cystic mastitis, surgical intervention is the only remedy.

Endocrine Treatment of Sterility.—The endocrine factor is said to be wholly or partly responsible for about 25 per cent of involuntary barrenness in married women.

About 4 per cent of our sterile patients have anovulatory cycles. The endocrine method of inducing ovulation is far from satisfactory. Many of our sterile patients showed evidence of an inadequate progestin phase. In other words, we have found a quantitative disproportion between estrin and progestin, resulting in an imperfectly formed pregravid endometrium which may prevent implantation of a fertilized ovum. The treatment here, although it is purely substitutional, is progesterone in 50 mg. doses given by the buccal or sublingual route during the second half of the cycle. When the luteinizing principle of the anterior pituitary is made commercially available, it is hoped that the effect may be lasting.

Menopause.—Estrogenic therapy is the treatment par excellence for the relief of menopausal symptoms. It constitutes the most spectacular form of organotherapy.

About one-third of the women in the menopausal period have symptoms so mild that no treatment is required at all; some have no symptoms. In the majority of those requiring therapy the symptoms are not too severe, but in a small percentage of patients the symptoms are marked. It must be kept in mind that the menopause occurs as the woman approaches her fiftieth birthday. The gall bladder and the myocardium may be undergoing important pathologic changes; all symptoms that these women have should not be ascribed to the menopause. The severity of the symptoms will so often depend on the general condition of the patient, that every effort should be made to improve her general condition. When possible, measures should be instituted prior to the menopause to insure an efficient level of general health.

In using estrogenic hormone for the control of menopausal symptoms, the minimum amount that will control symptoms without inducing bleeding should be used. This ideal is not always possible to attain, as the amount of estrogenic hormone necessary to control symptoms may also cause bleeding. One should not use estrogens when cancer is suspected or when fibroids are present. Should bleeding result even with the use of small doses of estrogenic hormone, it is best to substitute the androgenic hormone.

There are two general types of estrogens, the natural hormonal estrogens that are quite similar and usually identical to the intrinsic estrogens, and the synthetic estrogens whose pharmacologic properties resemble the intrinsic estrogens. We no longer use the synthetic estrogens because of the side effects which occur in many patients. When menopausal symptoms are marked, as much as 5 mg. of estrone sulfate is used per day. As soon as symptoms are relieved, one tablet of estrone sulfate (1.25 mg.) is used per day or every other day. This is continued for a period of two months. If the symptoms are relieved, no further treatment is necessary. Should symptoms recur, a second or even a third course of treatment can be given. There is no longer any necessity for the use of estrogens by hypodermic; the oral method of administration is quite effective.

It must be remembered that the so-called maintenance doses prolong the menopause. I have seen patients who have been taking estrogens for two years or more and still complain of frequent and prolonged bleeding. Novak has ably stated that "it is better to get the pituitaryovarian readjustment over with as soon as possible, using estrogen therapy as a temporary makeshift only when the severity of the vasomotor symptoms calls for it"

For patients in whom estrogens produce bleeding, the androgens may be substituted We may use testosterone linguets in 10 mg doses daily for a period of two or three months A second or even a third course may be necessary

For the patient who does not respond to estrogenic therapy, the vaginal smear technic will help to differentiate between the menopausal syndrome of estrogen deficiency and symptoms due to psychoneurosis

Endocrinology is far from being an exact science, and the trial and error method must still be employed in the management of many functional problems Our failures, though they are many, are offset by the gratifying successes

SUMMARY

The author discusses the development and increasing use of endocrine therapy, its advantages and disadvantages, with a warning against excessive, inappropriate or injudicious administration of hormonal preparations Functional bleeding, dysmenorrhea, amenorrhea, premenstrual tension, and midmenstrual pain and bleeding are discussed in relation to endocrine therapy, with the authors' recommendations in each instance

RIASSUNTO

L'A discute il sviluppo e l'aumento della terapia endocrina, i vantaggi e disavantaggi con avertimento contro l'accessivo amministrazione de preparazione ormoni poco appropriato o senza giudizio

Porta in discussione flusso sanguigno funzionale, dismenorrea, amenorrea, tensione pre mensile, dolore e flusso mezzo mensile a relazione della terpia endocrina con commendazione in ciascuno caso

RESUMEN

El autor discute el desarrollo y aumento de la terapeutica endocrina, sus ventajas y desventajas, con una advertencia contra la administracion excesiva, inadecuada e imprudente de preparaciones hormonales

Se discuten hemorragia funcional, dismenorrea, amenorrea, tension premenstrual y dolor y hemorragia mesomenstrual en relacion con la terapeutica endocrina, con recommendaciones del autor sobre el particular

RESUME

L'auteur discute le developpement et l'emploi augmentant de la therapie endoctrine, ses avantages et ses disavantages L'emploi excessif inapproprie ou irreflechi des preparation hormonales peut etre desastreus

La dysmenorrhee, l'amenorrhee, la tension premenstruelle et les douleurs et l'hemorragie mid menstruelle sont discutees en rapport avec la therapie endoctrine, l'auteur donne des recommandations pour chacun de ces etats

ZUSAMMENFASSUNG

Der Verfasser eroertert die Entwicklung, die wachsende Anwendung, die Vorteile und Nachteile der endokrinen Therapie und warnt vor einer uebermaessigen, unangemessenen oder unueberlegten Anwendung von Hormonpraeparaten

Funktionelle Blutungen, Dysmenorrhoe, Amenorrhoe, praemenstruelle Spannung und Mittelschmerz mit Blutung werden in ihrer Beziehung zur Hormontherapie besprochen, und der Verfasser macht seine Vorschlaege fuer die Behandlung der verschiedenen Zustaende

SUMARIO

O autor discute o desenvolvimento e o crescente uso de produtos endocrinos, suas vantagens e desvantagens, alertando contra a excessiva, impropria ou desordenada administração de preparados hormonais As hemorragias funcionais da dismenorreia, a amenorreia, a tensao premenstrual, e a dor, como a hemorragia, durante a mentsruação são discutidas em face da terapeutica endocrina, com as recomendações do autor em cada eventualidade

Polyethylene Intubation in Reimplantation of the Oviducts

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CHICAGO

THIS is a preliminary presentation of salpingo-uterine intubation with the polyethylene catheter in the treatment of sterility caused by tubal obstruction. The management of this type of sterility can be divided into three stages:

1. Surgical reestablishment of tubal patency.
2. Maintenance of tubal patency during the healing period.
3. Sustenance of tubal patency after healing has occurred.

Evaluation of the various methods used in the first phase will readily show that the corrective or reconstructive procedures (salpingolysis, salpingoanastomosis, salpingostomatomy and reimplantation of the oviducts into the uterus) are based on sound surgical principles and can be executed satisfactorily.

Similarly, in the third phase, after convalescence is completed, the uterotubal insufflation provides an ingenious and effective method for the maintenance of tubal patency, assuming that these passageways have remained open during the important postoperative days of the second phase, during which tissue healing takes place.

The management of this crucial second phase is the Achilles' heel of the treatment of obstructive tubal sterility. This remains so in spite of the free use of various antibiotics (in both preoperative and postoperative stages), which, by eliminating dormant pelvic infections, have to some extent reduced the high percentage of failures accompanying restorative tubal operations.

Insufflation and intubation was tried to minimize the dangers of reocclusion associated with uncontrolled postoperative healing of the reconstructed oviducts.

Holden and Sovak[1] advise uterotubal insufflations, starting them twenty-four to forty-eight hours after implantation of the oviducts into the uterus. Although this is a most useful method of sustaining tubal patency in Phase 3, after healing has occurred, the advisability of its early postoperative employment is debatable. One has to admit that in most laparotomized patients insufflation one to ten days after operation is neither practical nor safe. This is particularly true when tubal implantation has been performed, unless one is willing to expose the patient to the following risks:

1. Forcing potentially infected uterine content of blood and mucus into the new fundal ostia, into the tubes or into the peritoneal cavity.
2. Increasing the possibility of air embolism.
3. Causing emphysema by forcing gases into the still open tissue spaces.
4. Causing disruption, or even perforation of the uterus, in the freshly sutured parts at the site of the implantation.

Some of these complications have been reported in connection with insufflation even without preceding surgical intervention,[2] so one is justified in assuming that they will more readily occur if the insufflationary pressure is employed postoperatively when healing has not yet taken place.

A different approach has been suggested and used by other workers.

Shafeek[3] passes strings of chromic catgut through the lumens of the implanted tubes and leaves them in situ. He relies upon spontaneous absorption or disintegration of the catgut, and uses sterile oil to prevent postoperative adhesions.

Rottger[4] pulls a strand of iodized silk

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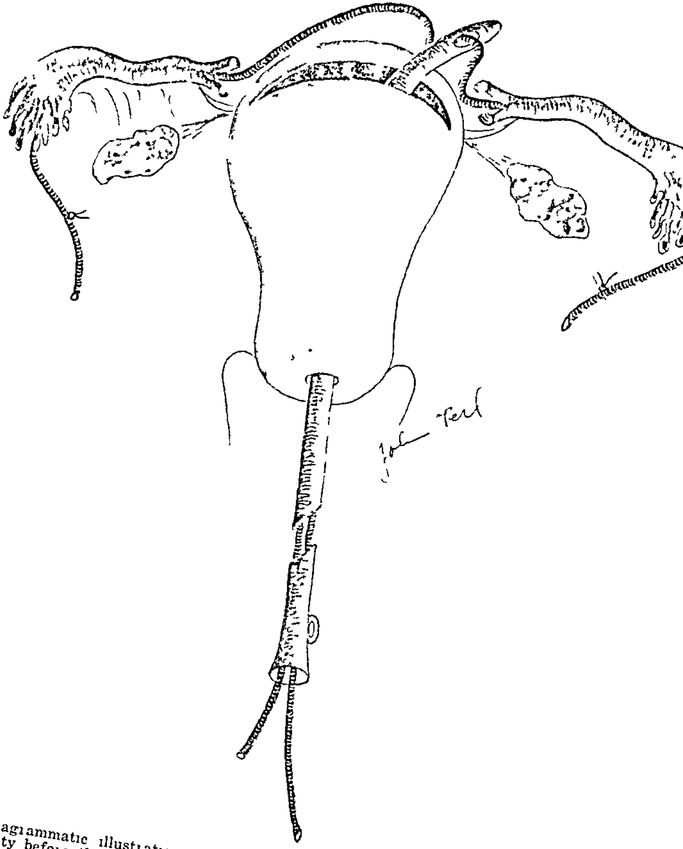

Fig 1—Semidiagrammatic illustration shows the metal male catheter, which was introduced into the uterine cavity before the laparotomy, now protruding through a transverse incision across the fundus Polyethylene tubing is threaded through the salvaged patent parts of the oviducts, which are now prepared for implantation with a 0 75 cm "fishmouth" incision at their proximal ends. The lateral ends of the polyethylene tubes are transfixed with No 000 chromic sutures and anchored to the peritoneum overlying the infundibulopelvic ligament, their medial ends being "piped" down via the metal catheter well beyond the vulva The rest of the operation follows the usual technic for tubal implantation.

through the salvaged patent part of the oviduct to be implanted. He does this with a long metal probe to which the silk is attached; then he maneuvers the instrument through a preformed cylindric opening (identical with Holden-Sovak's reaming operation) of the uterine horn downward into the uterine cavity, the cervical canal, the vagina and finally out of the introitus. The lower end of the iodized silk is cut loose from the probe and deposited into the posterior vaginal vault, while the abdominal end is left extending 5 to 8 cm. beyond the fimbriated portion of the implanted tube. The silk is removed in eight to ten days unless the tubo-uterine peristalsis spontaneously expels it sooner.

Westman[5] recommends the insertion of nonirritating cholesteroloxalate plugs into the newly formed abdominal ostia of the Fallopian tubes. The proper position of the plug is assured with one or two fine catgut sutures. He leaves these cholesteroloxalate inserts in situ for one month and removes them by vaccine-induced artificial fever, raising the patient's rectal temperature to 40.5 C., at which point the plug material melts. After the melting procedure, in order to remove all residual cholesteroloxalate, daily uterotubal irrigations are made with 40 cc. of saline-penicillin solution for three to five days. The procedure is limited to salpingostomotomy and similar operations on the distal portions of the oviducts.

Gepfert[6] secures a piece of allantoin membrane into the outer half of the fallopian tubes to prevent their reocclusion during the healing period. This method is also limited to operations performed on the distal part of the oviducts.

D'Ingianni[7] emphasizes the importance of larger caliber intubation than catgut or silk would provide at the site of the tubal implantation. To protect the new tubo-uterine ostium from compressions and obstruction, he inserts a flexible stainless steel cannula into the tubal end to be implanted. The cannula is provided with a bracing wire, which is carefully threaded through the uterine cavity and cervical canal into the vagina. The vaginal end of the wire is clipped off, enough being left to be curved over the portio vaginalis into the lateral fornix. He leaves the instrument in situ for three to four months, after which it is extracted with the help of the wire in the vaginal fornix.

Milnor, Bowles and McCorriston[8] intubate the reconstructed or reimplanted oviducts with a ureteral catheter introduced through the fimbriated end and passed into the uterus. The free end of the catheter is brought out through the abdominal incision, from which area it is removed within five days.

In review of the foregoing methods one may conclude that in the first two weeks of the postoperative period insufflation is neither a practical nor a safe procedure. To keep the tubal lumens open with chromic catgut or iodized silk is objectionable because of the small diameter, sheering surface and chemical impregnation of the intubating material, which all tend to damage the delicate ciliated epithelium of the tubal mucosa. The cholesteroloxalate plug is a nonirritating material, but it can be employed only in salpingostomies, and its removal with uterotubal irrigations subsequent to its melting with artificial fever seems to be too involved an operation. The allantoin membrane method of Gepfert is a very attractive procedure because the material is ideally harmless for intubation. Although its use has been restricted to operations on the distal half of the oviduct, there is no reason why it could not be employed in reimplantation of the tubes into the uterus.

The use of D'Ingianni's steel cannula is a technically complicated operation and is likely to cause pressure-induced fibrous changes at the site of application.

The method employed by Milnor, Bowles and McCorriston lacks one important factor, namely, the stabilization of the intubating catheter within the uterine cavity. The free intra-abdominal segment of the catheter between the fimbriated ostium of the tube and the abdominal incision is fully exposed to the pressure and the drag of loops of intestine, which could easily dislodge the catheter.

To avoid some of the undesirable features and shortcomings of the methods enumerated, I recommend the use of a 1.5 mm. polyethylene tube for temporary catheterization of the reconstructed tubo-uterine passageways. This material is smooth, flexible, elastic, strong and, from the physiochemical point of view, inert.

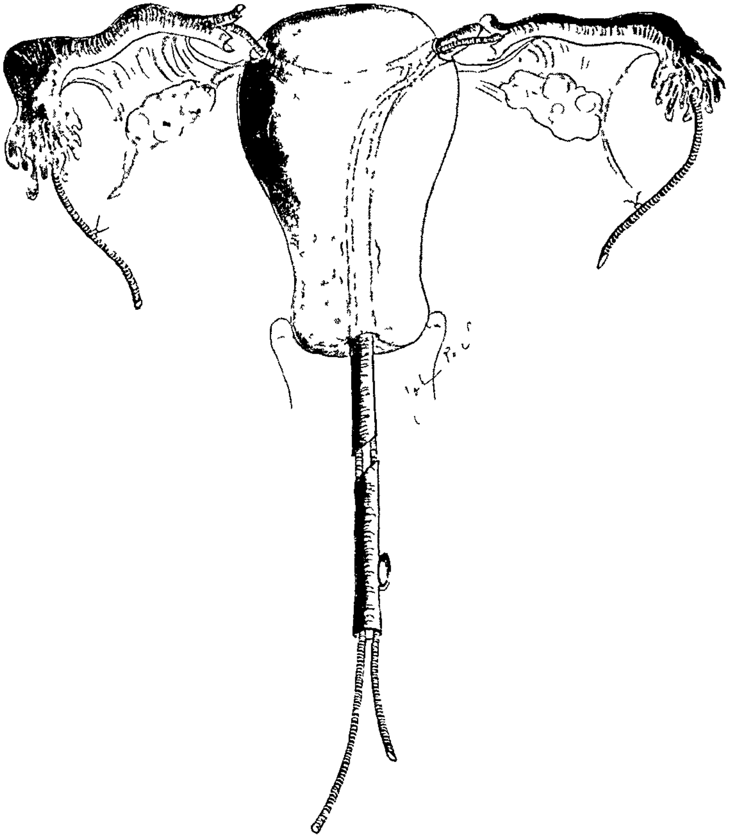

illustration shows technic of salpingouterine catheterization when em type of tubal implantation As in the previous illustration, the poly d through the salvaged patent parts of the oviducts which are prepared ve the plastic tubing in this "reaming" operation the tip of the metal catheter is pushed out first through one of the preformed cylindric openings on the uterine horns After the "piping down" process is completed, the metal catheter is slightly withdrawn into the uterine cavity and its tip maneuvered through the reamed hole of the opposite side to receive the second polyethylene tube After both plastic tubes are 8 to 10 inches (to cm) outside the introitus, the metal catheter is carefully removed, the plastic inserts being left in situ The chromic sutures which anchor the plastic catheters to the peritoneum over the infundibulopelvic ligament may be placed after removal of the metal catheter If so, the intra abdominal ends of the plastic tubings should be temporarily secured with hemostats to prevent their slipping away The rest of the operation follows the technic of implantation applicable to the reaming operation

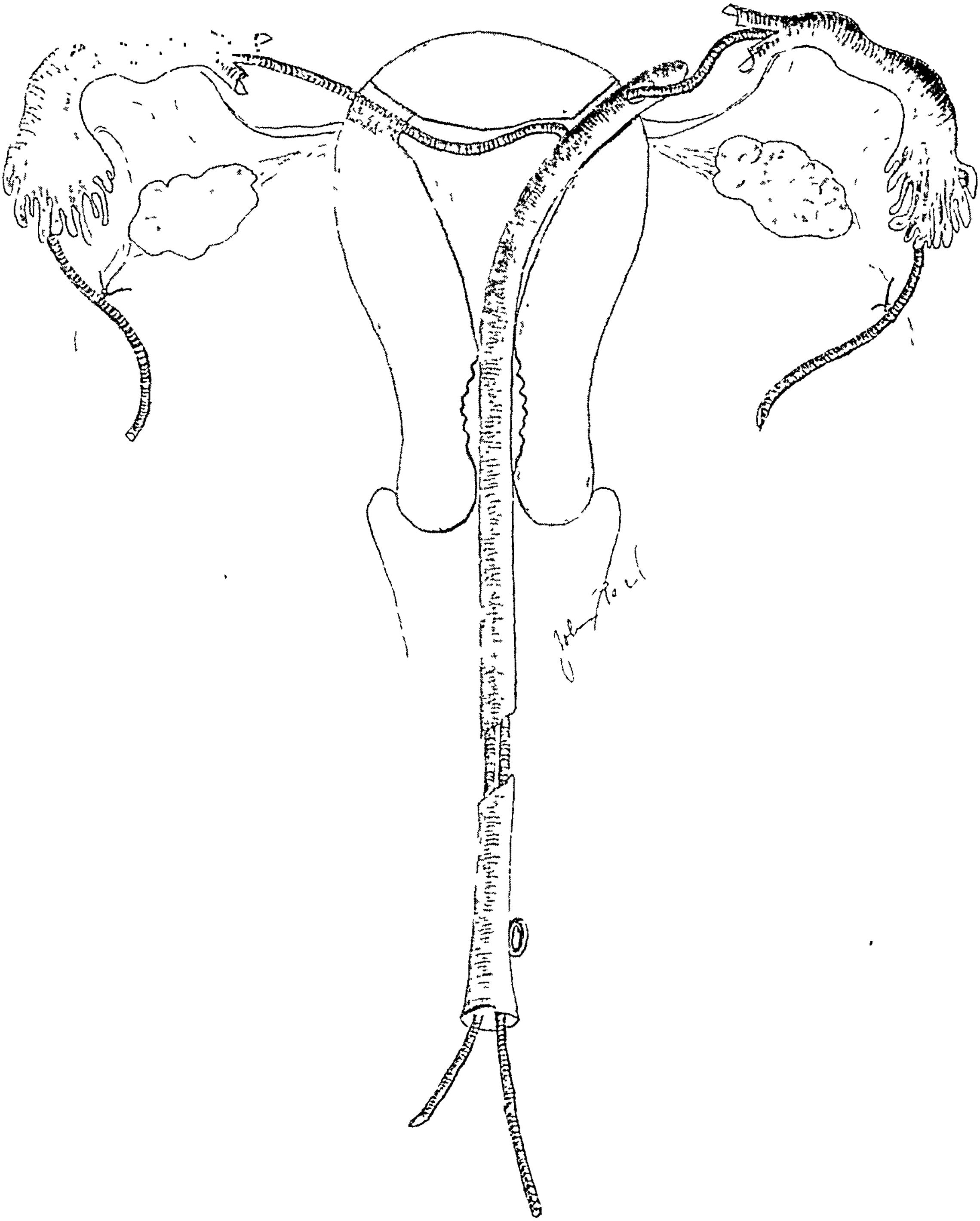

Fig. 3.—Illustration showing essentially the same procedure as in Figure 2, with the uterine cavity exposed by longitudinal section. One polyethylene tube has been "piped" down through the metal catheter; the tip of the latter now emerges through the opposite cornu's cylindric opening to receive the second plastic tube. The implanting sutures are omitted for the sake of clarity.

It can be threaded without difficulty into and through the tubal lumens and, because of its smooth, pliable elasticity, it conforms without any pressure to the configurations of the latter.

The procedure of tubo-uterine cathe-

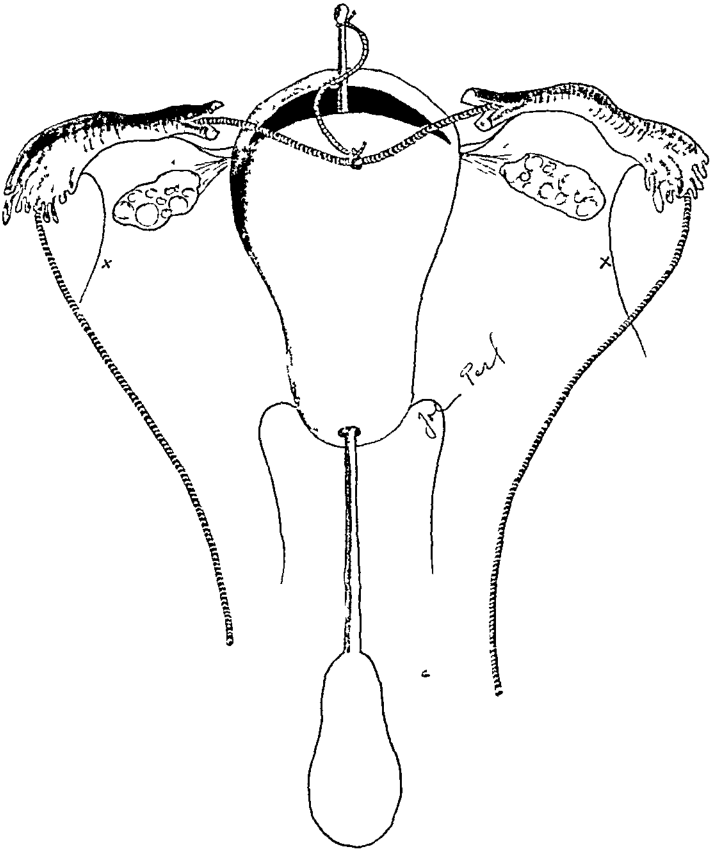

Fig 4—When transverse fundal incision is employed in tubal implantation, instead of the metal catheter, a uterine probe can be used for transportation of the plastic tubing to outside the introitus This illustration shows the oviducts suspended upon the polyethylene tubing and prepared in the usual manner for implantation The fundal cavity is exposed by a transverse incision, the tip of the uterine probe is moved into view, and heavy braided silk is tied below its knob The other end of the silk is tied over the free midsection of the polyethylene catheter between the fallopian tubes, after which the probe is withdrawn, pulling silk and plastic tubing outside the vulva Routine implantation of the oviducts will follow, with closure of the fundal incision The abdominal ends of the plastic catheter will be anchored to the peritoneum of the infundibulopelvic ligament at the points marked X.

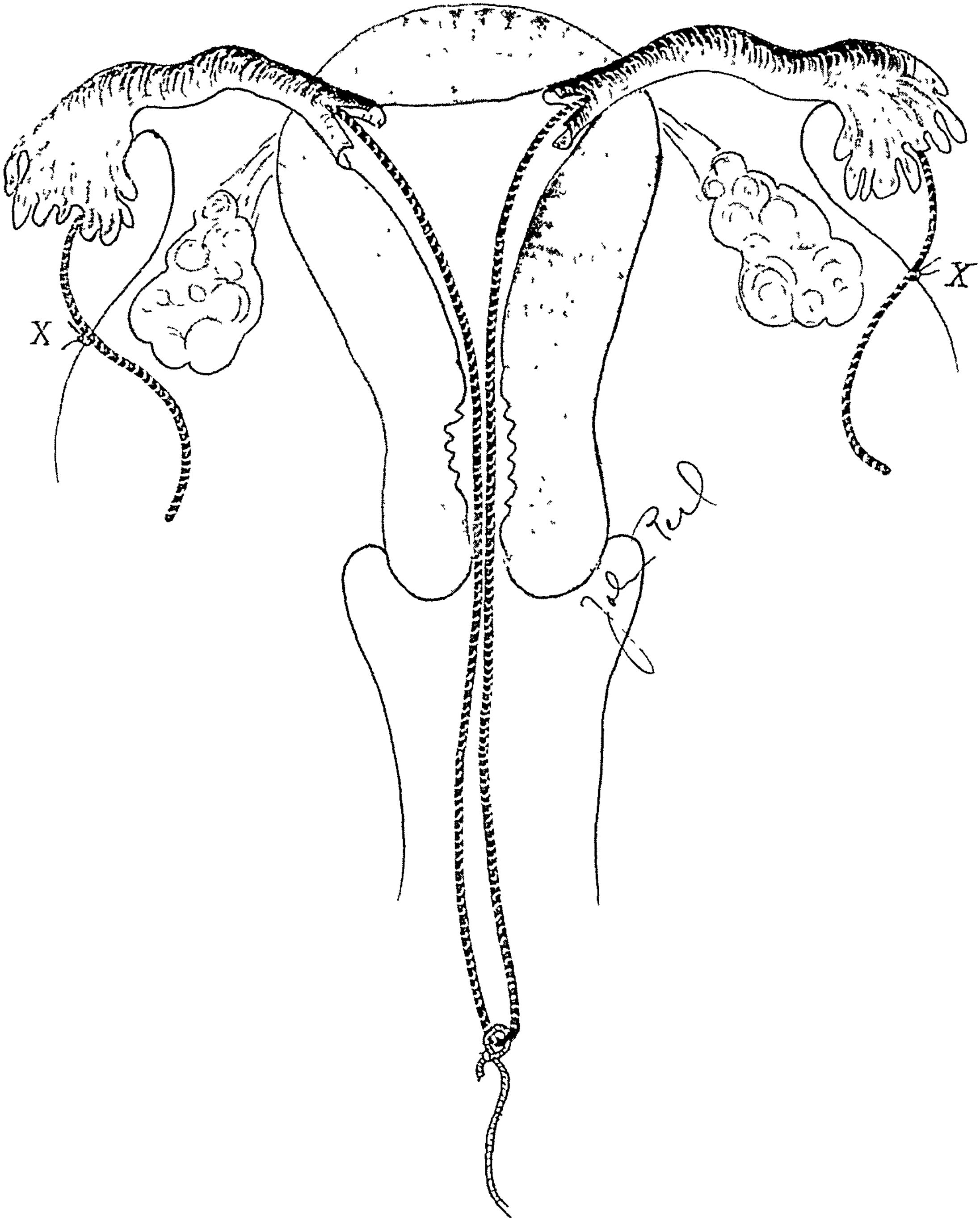

Fig. 5.—Longitudinal section of the uterus, showing both oviducts implanted into the cornua, with an intubating catheter in the entire length of the genital canal. The abdominal ends of the plastic tubing are anchored at *X* to the peritoneum; the rest has been pulled to outside of the vulva, where it is securely taped to the prevulvar skin.

terization is simple, and it is readily adaptable to all forms of tubal implantation. The essential points are as follows:

1. Both ends of the intubating plastic catheter are anchored in such a manner that tubo-uterine peristalsis cannot dislodge it. This is accomplished with a transfixing suture of the abdominal end

of the catheter to the pelvic peritoneum, just below the fimbriated ostium of the oviduct, and by securing the external end of the catheter to the prevulvar skin.

2. A metal male catheter or a uterine probe is used for transportation of the polyethylene tube via uterus and vagina to the outside of the introitus. Before laparotomy, one of these instruments is introduced into the uterine cavity, and the prevulvar portion of its shaft is fastened to the skin with adhesive tape. When ready for laparotomy, the patient's legs should be sufficiently in abduction to facilitate the manipulation of these carrier instruments during the operation.

Otherwise, the technic is best explained by the illustrations.

After the operation is completed, the polyethylene tubes, as they emerge from the introitus, are rearranged and secured in such a position as not to interfere with walking or with the routine daily care of the anovulval region.

The intubating catheters are left in situ for twelve to fourteen days (that is, for the period of tissue healing) or longer if desired. For removal, a slight tug upon the prevulvar part of the tubing is sufficient to break the anchoring pelvic sutures and permit painless extraction. The follow-up treatment, in the form of uterotubal insufflation, may be started when all pelvic tenderness and vaginal discharge have ceased.

SUMMARY

1. The importance of controlled healing after reconstructive operations on the fallopian tubes is emphasized.

2. For splinting the site of tubal implantation, a technic of *anchored* polyethylene intubation of the salpingouterine passageways is presented.

RESUMEN

1. Se señala la importancia de la curación verificada después de operaciones reconstructivas de las trompas uterinas.

2. Se presenta una técnica para fijar con polietileno la entubación de las vías salpingouterinas.

ZUSAMMENFASSUNG

1. Es wird die Wichtigkeit einer kontrollierten Heilung nach Wiederherstellungsoperationen an den Eileitern hervorgehoben.

2. Es wird eine Technik der Intubation der Durchgaenge vom Uterus in die Eileiter mittels eines verankerten Polyethylenrohres beschrieben. Das Verfahren soll zur Schienung der Gegend der Tubeneinpflanzung dienen.

RÉSUME

1. On insiste sur l'importance de la cicatrisation après les opérations sur les trompes de Fallope.

2. On présente une technique qui consiste à placer un tube de polyéthylène pour tuneliser la voie salpingo-utérine qui a été incisée.

RIASSUNTO

1. L'importanza di guarigione controllata dopo operazioni ricostrutive sulla tromba di Fallope e' accentuata.

2. Presenta una tecnica di intubazione ancorata di polyethylene del vestibolo salpingo—uterino, come bendaggio al sito del impiantamento tubale.

SUMÁRIO

1) A importancia de cicatrização controlada depois de operações reconstrutivas sobre as trompas de Fallópio é realçada.

2) Para encanar o sítio da implantação túbaria, uma técnica de intubação dos condutos salpingo-uterinos por polyethyleno ancorado é descrita.

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Echoes of the Past

IX. THE ORIGIN OF MEDICAL LICENSURE

There were no rules or regulations to guide the physician up to the year 200 A. D. It is true however that a voluntary code of ethics was accepted in some instances by physicians. The ethical code was based upon the oath of Hippocrates. In the year 200, Septimus Severus finally introduced a system of licensure. Twenty-five years later Alexander Severus honored the physicians by accepting them in the same category as imperial physicians.

Under the decree of licensure certain acts were punishable. For example, the administration of an abortifacient or criminal neglect of a patient was punished by a heavy fine. The license of a convicted abortionist could be revoked.

Other regulations governed the physician's conduct. Many restraints were voluntary or were based upon advice given to the doctors by their teachers. Galen instructed his students concerning the behavior of the physician toward his patient, emphasizing the need of courtesy and solicitous interest.

Prior to undertaking the study of medicine, a student was required to submit a certificate of good moral character. This may be compared in some way to the student's qualifying certificate demanded by some states prior to matriculation in a medical school.

It was in 370 A.D. that an imperial edict ordered the acquisition of a premedical certificate. Before entering upon his studies, each student had to present a certificate from his local police officer, testifying to the candidate's good conduct and containing his current address. Additional restrictions were placed upon the student after matriculation. The young men were forbidden to join illegal societies or to enter brothels and were warned against keeping any house revelries going too long. Repetition of the offense brought dismissal.

The foregoing restrictions on medicine in ancient Rome became the basis for the many regulations imposed upon medicine in our own age. A great difference, however, existed in the benefits derived by the people from the medical profession; medical knowledge at that time was available only to the wealthy. No one was concerned with the poor, and no official authority demanded that assistance be given them. The physician himself never considered treating them free of charge.

—*Bernard J. Ficarra, M.D., F.I.C.S.*

Personal Evaluation of Vagotomy in the Treatment of Peptic Ulcer

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IN attempting to evaluate any new surgical procedure one is dependent upon the contemporary literature. The permanence and scope as well as the limitations of the operation can best be established by personal experience.

Since 1946, vagotomy alone or vagotomy combined with some other procedure has been performed by me in 89 instances for the treatment of peptic ulcer. In 56 of these the follow-up has been of sufficient duration and detail to establish the following facts: (*1*) that the overall results of this series were not especially good, and (*2*) that the poor results were caused either by incomplete operation, by poor selection of the patient for the procedure used, or by violation of a surgical principle having no bearing upon division of the vagus nerve.

This presentation will include a statistical report of results obtained with vagotomy, a review of case histories of patients with peptic ulcer in whom un*satisfactory sequelae followed division of* the vagus nerves, and an attempt to establish, from these observations, criteria for the selection of ulcer patients most likely to be benefited by vagotomy.

Clinical Data.—From June 1946 to August 1949, 56 patients have been subjected to vagotomy for the treatment of peptic ulcer on my private surgical service at Presbyterian Hospital, Denver. These patients have been followed for thirteen to fifty months both by personal visits and by questionnaires.

The general indications for operation were (*1*) marginal ulcers and (*2*) duodenal ulcers. All patients with duodenal ulcers were referred by competent internists who considered the ulcers refractory to conservative treatment. Patients having a history of duodenal ulcer with hemorrhage were considered unsuitable candidates for vagotomy.

Vagotomy was performed for duodenal ulcer in 48 patients, for marginal ulcer in 5 and for gastric ulcer in 3 (Table 1). Unknown to me at the time of operation. 1 patient with a duodenal ulcer had had significant bleeding. Three of the 5 patients with marginal ulcers had noted moderate to severe bleeding from the upper part of the gastrointestinal tract.

The series consisted of 44 men and 12 *women, whose ages ranged from* 22 *to* 81 years. The average age was 44.2 years.

Results.—The results obtained by vagus section in this series are recorded in Tables 1 and 2. Six of the patients on whom transthoracic vagotomy was performed are considered to show satisfactory results. For 3, or 33.3 per cent, the operation is considered to have been a failure. Forty-two patients obtained satisfactory results from transabdominal vagotomy, and in 6 of these the operation was confined to division of the vagus nerves without additional gastric procedures. One patient in this group in whom the operation failed, also underwent vagotomy only. Four of 32 patients *undergoing vagotomy combined with pos*terior gastroenterostomy obtained results considered to be unsatisfactory. All of the 8 patients subjected to vagotomy combined with subtotal *gastric resection* obtained satisfactory results.

Five patients with marginal ulcers obtained satisfactory results after section of the vagus nerves. Eleven complications and 1 death occurred during hospitalization in this series (Table 3).

Read at the Fifteenth Annual Assembly of the United States Chapter, International College of Surgeons, Cleveland, Oct. 31, 1950.
Submitted for publication Nov. 27, 1950

TABLE 1.—*Type of Ulcer and Operative Procedure*

Operation	Duodenal Ulcer		Jejunal Ulcer		Gastric Ulcer		Total	
	Cases	Failures	Cases	Failures	Cases	Failures	Cases	Failures
Transthoracic vagotomy	6	2	2	0	1	1	9	3
Subdiaphragmatic vagotomy only	6	1	1	0	0	0	7	1
Vagatomy and gastroenterostomy.	32	4	0	0	0	0	32	4
Vagatomy and gastric resection	4	0	2	0	2	0	8	0
Totals . . .	48	7	5	0	3	1	56	8

TABLE 2.—*Results of Section of Vagus Nerves*

Operation	Cases	Good Results	Failures	% of Failures
Transthoracic vagotomy	9	6	3	33.33
Subdiaphragmatic vagotomy only	7	6	1	14.28
Vagotomy and posterior gastroenterostomy......	32	28	4	12.5
Total	56	48	8	14.3

Several patients had some undesirable side effects, such as gastric retention, mild to moderate diarrhea, intercostal neuralgia and eructation of foul gas. Except as noted in the case histories, these were either temporary or so mild that they were not considered significant when the patients completed the follow-up questionnaires. Unsatisfactory results were noted in 14.3 per cent of the cases in this series.

Analysis of Failures.—Brief case histories illustrating failures are presented in the following paragraphs.

CASE 1.—A 36-year-old man with typical ulcer pain of fifteen years' duration was referred for surgical treatment on July 5, 1946. His symptoms were intractable to a well regulated medical regimen.

Roentgenograms of the upper part of the gastrointestinal tract demonstrated a stomach which emptied rapidly and a large duodenal ulcer deformity. The level of gastric acidity and that of night secretion of gastric juice were elevated.

TABLE 3.—*Postoperative Complications*

Complication	No. of Cases
Atelectasis	3
Pleural effusion .	2
Thrombophlebitis .	2
Bronchopneumonia . .	1
Pulmonary embolism . .	1
Acute gangrenous cholecystitis .	1
Pulmonary edema (cardiac failure) ..	1
Total	11

A transthoracic vagotomy was carried out on July 10, 1946. The patient's convalescence was marked by moderate atelectasis of the lung on the surgically treated side. He was discharged from the hospital on the tenth postoperative day. His original symptoms returned three months after operation and were again refractory to medical treatment. Gastric analysis after administration of insulin indicated incomplete division of the vagus nerves. The patient remained asymptomatic after a subtotal gastric resection performed elsewhere in March 1949.

Comment: This failure was obviously due to incomplete resection of the vagus nerves at the time of the patient's original operation.

CASE 2.—A 46-year-old man was admitted to the hospital on Oct. 12, 1946, complaining of epigastric distress, anorexia and weight loss. *Gastric analysis and quantitative night* secretions were normal. Gastrointestinal roentgenograms revealed the presence of a penetrating ulcer high on the lesser curvature of the stomach. The lesion was easily visualized with a gastroscope and had the appearance of a benign gastric ulcer.

Transthoracic division of the vagus nerves was accomplished on October 22. The patient's convalescence was uncomplicated, and he was dismissed from the hospital on the eighth postoperative day. The symptoms had been completely alleviated; the appetite returned to normal, and the patient began to gain weight. Three weeks after operation the gastroscopist reported that the gastric ulcer had diminished, and gastroscopic examination during the sixth postoperative week revealed only a scar at the old ulcer site Gastrointestinal roentgenograms revealed *no abnormality* In March 1947 the patient had a recurrence of his original gastric distress Gastric analysis revealed achlorhydria, the *status of which was unchanged after the injection* of histamine and insulin The gastroscopist stated that the diameter of the recurrent ulcer was greater than when visualized before the operation On examination the crater appeared to be shallow and the edges of the ulcer elevated Neoplastic transformation was suspected, and the patient was urged to have his abdomen explored At abdominal exploration on April 8 the gallbladder was seen to be distended, but it emptied upon the application of slight pressure, and it apparently contained no stones The head of the pancreas was markedly enlarged and had the consistency of a ball of yarn The stomach and the walls of the small intestine appeared to be thickened, but they felt very light when held and manipulated with the palpating hand There was a large ulcer high on the lesser curvature Subtotal gastric resection was carried out without technical difficulty The resected stomach was opened by the pathologist, and, in addition to a large benign ulcer on the lesser curvature, many small, shallow ulcers and erosions were found over the mucosa of the distal half of the stomach The patient's convalescence from this procedure was uncomplicated He has remained asymptomatic, and has maintained an excellent state of nutrition for four years

Comment The recurrence of a gastric ulcer four months after complete interruption of the vagus nerves places the status of this operation for the treatment of gastric ulcer in a questionable category

CASE 3 —A 39-year old laborer had been entirely free from ulcer pain for one and one-half years after a transthoracic vagotomy He had been disabled periodically for ten years prior to this procedure One month before his second admission, postprandial epigastric fullness and nausea developed, and the patient regurgitated foul liquid material and poorly digested particles of food Gastric analysis failed to reveal the presence of free hydrochloric acid Gastrointestinal roentgenograms showed complete retention of a barium meal twenty-four hours after its ingestion The stomach was atonic and markedly dilated

The patient reluctantly submitted to a posterior gastroenterostomy on Feb 18, 1948 His postoperative course was complicated by *gastric dilatation and marked retention of* gastric secretions Doryl and urecholine were helpful A thirty-day period of hospitalization was necessary The patient is now free *from ulcer pain His appetite is poor, and he* complains of eructating foul gas and of frequent regurgitation of food The notes appended to this patient's questionnaire imply complete dissatisfaction with the 'second operation" for ulcer Requests for further gastrointestinal studies have been refused

Comment Experience with this case *indicates that a delayed drainage operation* is ineffective because permanent changes in the tone of the gastrointestinal tract have transpired

CASE 4 —A 54-year old obese housewife was admitted to the hospital on Feb 7, 1947, with a history of ulcer pain for twenty four years An acute perforation occurred in 1941, and the pain had finally become unbearable Roentgenograms of the gastrointestinal tract showed a duodenal ulcer with marked deformity of the duodenal cap The stomach emptied rapidly At operation one month later a penetrating duodenal ulcer was demonstrated, although the diameter of the duodenum appeared to be adequate An omental patch was sutured over the ulcer, and a subdiaphragmatic vagotomy was accomplished Four months after this operation the patient was attacked by nausea, vomiting, abdominal pain and fever *The gastric acid level* was high, and there was a maximum response to the insulin test Roentgenograms of the upper part of the gastrointestinal tract *demonstrated a persistent duodenal ulcer defect* Four days after hospitalization, deep jaundice developed, the liver was palpable, and laboratory data compatible with homol*ogous serum jaundice were obtained* The jaundice was thought to be due to plasma given at the time of operation four months earlier Convalescence from this illness was *stormy* The patient has remained free *from* ulcer pain and has normal digestion

Comment This case is listed as a failure because it is obvious that complete vagotomy was not accomplished and the patient has a persistent duodenal ulcer It does, however, illustrate the fact that some patients with incomplete vagus section get complete relief of their ulcer pain

CASE 5.—A 50-year-old farmer was subjected to subdiaphragmatic vagus section and posterior gastroenterostomy on June 6, 1947. This operation followed twenty years of only partially successful medical treatment for duodenal ulcer.

At the end of one year the patient reported by letter that he felt better than at any time during the past twenty years. In answering a questionnaire mailed in the early spring of 1950, the patient's wife reported that he had expired suddenly from a massive hemorrhage of the upper part of the gastrointestinal tract. Subsequent correspondence revealed that the patient had bled prior to his operation in 1947. This important item in the patient's history had not been obtained previously.

Comment: This unfortunate experience demonstrates and reemphasizes the importance of removal of the ulcer in patients past middle age who have a history of bleeding. It is felt that any operation accomplishing less than this is inadequate.

CASE 6.—An 81-year-old man was referred for surgical exploration because of a prepyloric defect demonstrated on two roentgen examinations of the gastrointestinal tract. He had lost 30 pounds (13.6 Kg.) and had some midepigastric distress. Gastric analysis revealed hyperacidity. Abdominal exploration one week after admission revealed a peculiar congenital defect in the duodenum. Distal to the pyloric ring the duodenum turned sharply in a posterior direction. Its second portion was bound down by a congenital band. An active ulcer was visualized just proximal to this anomaly. The reason for the diagnostic mistake seemed obvious. Because there was some obstruction and the patient had a high gastric acid level, a posterior gastroenterostomy and subdiaphragmatic vagotomy was deemed the operation of choice.

On the tenth postoperative day the patient experienced excruciating pain in the upper part of the abdomen, fever and leukocytosis. He was extremely tender in the right upper quadrant, and a mass which felt like a distended gallbladder could be palpated. Exploration revealed acute gangrenous cholecystitis. Because of the patient's poor condition drainage was instituted and the abdomen closed. The patient left the hospital in good condition fourteen days after this procedure, and the drain was removed from the fundus of the gallbladder on the twenty-first postoperative day. He felt well for three months and then died suddenly from bile peritonitis secondary to a silent perforation of the gallbladder.

Comment: The error in this case was in performing the original operation. A well controlled medical regimen would undoubtedly have given this patient sufficient relief to carry him through the remaining years. The altered physiologic process that produces a gangrenous change in the gallbladder causes us to question the advisability of vagus resection in older persons.

CASE 7.—A 60-year-old man with a long-standing history of gastric distress was admitted to the hospital on Feb. 12, 1947. A persistent duodenal defect was demonstrable on the roentgenograms that the patient brought with him. Gastric analysis and night secretion studies were not obtained.

On February 13 the patient was subjected to subdiaphragmatic section of the vagus nerves and a posterior gastroenterostomy. The duodenum was not visualized because of adhesions. The postoperative course was complicated by atelectasis and marked gastric retention. Continuous suction was necessary for twelve days after operation.

The patient was dismissed from the hospital on the twenty-fourth postoperative day. However, vomiting persisted; the patient lost weight and complained of extreme weakness after meals. We were informed by another surgeon, who disconnected the gastroenterostomy and repaired a large postoperative ventral hernia six months later, that he showed no evidence of having had a duodenal ulcer at any time.

Comment: This failure can be attributed to insufficient study of the case before, during, and after operation. A neurotic patient seeking help had a "dumping syndrome" and a large postoperative ventral hernia added to an already severely overtaxed nervous system.

CASE 8.—A 56-year-old teacher who had thyroid heart disease and a long-standing history of duodenal ulcer was admitted to the hospital in July 1949. In the month preceding admission she had lost 20 pounds (9.1 Kg.), and stated that she found it difficult to retain fluid or food. The patient had a nodular goiter, and the referring physician stated that she had had auricular fibrillation almost constantly for two years. There was complete retention of a barium meal After considerable consultation the patient was subjected to a posterior gastroenterostomy and subdiaphragmatic section of both vagus nerves She was given 1 000 cc of blood and 1 000 cc of dextrose and saline solution during and immediately after the operation However, she died twelve hours after operation of pulmonary edema

Comment This failure was considered due to excessive parenteral fluid administration

SUMMARY

This paper consists of an evaluation of the author's personal experience with vagotomy in the treatment of peptic ulcer Included are statistical reports of results obtained with vagotomy and brief case histories of patients who obtained unsatisfactory results As a result of this experience the author considers vagotomy definitely beneficial and indicated for properly selected patients with duodenal ulcer In his opinion, however, vagotomy is contra-indicated for (1) older patients, especially those past middle age, (2) patients with a history of hemorrhage, and (3) patients with gastric ulcer Vagotomy has its greatest efficacy in patients with duodenal ulcers without a history of hemorrhage, for whom sufficient, properly supervised treatment has failed These patients should be carefully studied and evaluated prior to operation With the foregoing experiences and opinions in mind, it is believed that vagotomy has a definite place in the armamentarium of the surgeon today

RESUME

Cet article relate les experiences de l'auteur dans le traitement de l'ulcere peptique par la vagotomie L'auteur inclut aussi ses statistiques, un bref resume historique de chaque cas heureux et malheureux Comme conclusions, l'auteur affirme que la vagotomie est indiquee dans certains cas d'ulceres du duodenum, cas cependant qui doivent etre bien choisis Il opine que la vagotomie est formellement contre indiquee, lo chez des patients d'age moyen, 20 qui ont fait une hemorragie, 30 ceux qui souffrent d'ulceregastrique La vagotomie est tres efficace comme traitement chez ceux qui n'ont pas d'hemorragie et qui apres un traitement suffisant et suivi n'ont pas eu de resultat satisfaisant Chaque cas doit etre etudie avec prudence et un estime de leur etat fait Se basant sur ses experiences et sur ses faits cliniques, l'auteur pretend que la vagotomie a une place tres definie dans l'arsenal therapeutique du chirurgien contemporain

RESUMEN

Se consigna una evaluacion de la experiencia personal del autor con la vagotomia en el tratamiento de la ulcera peptica Se incluyen informes estadisticos de los resultados obtenidos con la vagotomia, así como breves historias clinicas de pacientes en quienes el resultado no fue satisfactorio El autor considera, como resultado de esta experiencia, que la vagotomia es definitivamente beneficiosa y esta indicada en casos adecuadamente seleccionados de ulcera duodenal Sin embargo, la estima contraindicada en (1) pacientes que han pasado la edad media, (2) pacientes con antecedentes de hemorragia y (3) pacientes con ulcera gastrica Considera que la vagotomia da mejores resultados en pacientes ulcerosos duodenales sin antecedentes hemorragicos, en quienes haya fracasado un tratamiento suficientemente y adecuadamente vigilado Estos pacientes deben ser cuidadosamente estudiados y evaluado su estado antes de la operacion El autor sostiene que, en atencion a las experiencias y observaciones antedichas, la vagotomia tiene un lugar definitivo en el arsenal del cirujano moderno

ZUSAMMENFASSUNG

Die Arbeit enthaelt eine Auswertung der persoenlichen Erfahrungen des Verfassers mit der Vagotomie in der Behandlung des peptischen G[illegible]

schlossen sind Statistiken von mit Vagotomie erzielten Ergebnissen und kurze Krankheitsgeschichten von Patienten, bei denen die Resultate unbefriedigend waren. Auf Grund seiner Erfahrung betrachtet der Verfasser die Vagotomie als durchaus wertvoll und angezeigt in sorgfaeltig ausgewaehlten Faellen von Zwoelffingerdarmgeschwueren. Er haelt jedoch die Vagotomie fuer kontraindiziert (1) bei Kranken jenseits des mittleren Lebensalters, (2) bei Kranken mit einer Anamnese von Blutungen und (3) bei Kranken mit Magengeschwueren. Am wirksamsten ist die Vagotomie bei Kranken mit Zwoelffingerdarmgeschwuer ohne Blutungen, bei denen eine ausreichende und sorgfaeltig ueberwachte medizinische Behandlung versagt hat. Diese Kranken sollten vor der Operation genau beobachtet und einer Auswertung ihres Zustandes unterzogen werden. Unter Beruecksichtigung aller dieser Erfahrungen und Beobachtungen kommt der Verfasser zu dem Schlusse, dass die Vagotomie ihren wohleingeordneten Platz im Ruestzeug des modernen Chirurgen innehat.

RIASSUNTO

Questi documenti parlano d'una valutazione dell'esperienza personale del'A. con vagotomia nel trattamento di ulcera peptica. Compresovi relazioni statistiche dei risultati ottenuti con vagotomia e breve storie di pazienti nei quali i risultati furono poco soddisfacente. Come risulto di quest'esperienza l'A. considera vagotomia definitivamente vantaggioso ed indicata nei casi propriamente scelti di ulcera duodenale. Nel sua opinione, tuttavia, vagotomia e' contra-indicata per (1) pazienti passato media eta', (2) pazienti colla storia di emorragia e (3) pazienti con ulcera gastrica. Vagotomia e' il piu efficace per pazienti con ulcera duodenale senza emorragia, pei quali trattamento bastante e sorveglianza propria ha fallito. Questi pazienti dovrebbero essere studiati attentamente e loro stato valutato in anticipo dell'operazione. Con le precedenti esperienze ed osservazioni in mento, l'a. sostene che vagotomia ha luogo definito nel armamentarium del chirurgo moderno.

SUMÁRIO

Este artigo contem um resumo da experiencia pessoal do autor com a vagotomia no tratamento da ulcera peptica Foram incluidos dados estatisticos obtidos com vagotomias como tambem histórias abreviadas de pacientes nos quais os resultados não foram satisfatorios. Baseado em sua experiencia o autor considéra a vagotomia de indubitavel utilidade e acredita que ela seja indicada nos casos de ulcera duodenal devidamente selecionados. Em sua opinião, contudo, a vagotomia está contraindicada em (1) pacientes alem de meia idade, (2) pacientes com caso de hemorragia e (3) pacientes com ulcera gastrica.

A vagotomia é mais eficaz em enfermos portadôres de ulcera duodenal sem casos de hemorragia, nos quais o tratamento clínico propriamente conduzido fracassou. Estes pacientes devem ser cuidadosamente estudados e suas condicões avaliadas antes da operação. Devido as precedentes experiencias e observações pessoais citadas a autor sustenta seu ponto de vista de que a vagotomia já tem um lugar definido no armamentario do cirurgião moderno.

> The *Iliad* is great because all life is a battle; the *Odyssey* because all life is a journey, and the Book of Job because all life is a riddle.
>
> —*Chesterton*

Pilonidal Sinus

Etiology of Recurrence

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SURGICAL treatment of pilonidal sinus is frequently complicated by postoperative recurrence. The purpose of the present study is to evaluate certain factors responsible for this recurrence on the basis of observations made at a large military general hospital. A section on pathology will discuss and compare the histologic character of surgical specimens obtained from patients with initial and recurrent pilonidal sinus. A second section will evaluate the clinical aspects of pilonidal disease and the surgical technic used in 247 cases.

Prior to 1924, Stone[1] could find less than a dozen articles on pilonidal disease occurring in the preceding sixty years. In the past twenty five years many reports have been published, but, with the exception of a few,[2] no confirmation of the clinical diagnosis by histologic study was obtained. The clinical history and physical observations as a general rule have been accepted as sufficient evidence to establish the diagnosis. Conclusions drawn from any such series which have not been confirmed by histologic study introduce a statistical error, since in 3.5 per cent of cases in the present series a diagnosis other than pilonidal sinus was made when sectional examination was done.

PATHOLOGIC PICTURE

A discussion of recurrent pilonidal sinus should begin with a definition of terms frequently used in describing this entity. "Pilonidal" is derived from the Latin "pilus" (hair), plus "nidus" (nest).[3] The chief characteristic of the disease is the presence of a tract in which are collected the products of dermal activity.[4] Though the disease may occur in many areas of the body, common clinical usage has limited the term "pilonidal sinus" to most draining lesions in the sacrococcygeal area. The term "recurrent" is added to the diagnosis when a draining lesion is observed after surgical treatment of pilonidal sinus. The factors responsible for this recurrence have been extensively investigated. The histologic character of the recurrent lesion, according to some observers,[6] reveals the factors responsible for recurrence, these being dermal elements remaining as a result of incomplete extirpation of the sinus tract during the initial operation. Because of this teaching it has been postulated that when a sinus reappears in a site previously subjected to operation for pilonidal sinus, the recurrent sinus represents a return of the original condition together with its histologic characteristics. Kleckner[8] and other investigators[9] have maintained that many of these recurrences are due to inadequate after care. Other investigators contend that recurrence is due to neglect of surgical principles in closure of the operative wound.[10] One group maintains that the histologic nature of recurrent pilonidal sinus has etiologic significance, another group holds that clinical factors are primary in producing recurrence.

The present study evaluated the proportionate importance of the two divergent opinions, and was begun with an analysis of the histologic character of pilonidal disease. Surgical specimens from initial and recurrent sinuses were sectioned, examined and compared. For the purpose of comparison, three cellular components, hair, epithelium and type of inflammation, were statistically evaluated as to egree of presence in each typ air component was limite e

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granulation tissue or below the derma. Significance was ascribed only to that hair which was enveloped by a cuff of inflammatory tissue, with destruction of either the follicle or the shaft. The epithelium component was that bordering upon a sinus or cyst observed deep in the surgical specimen and below the derma. Three types of inflammation, acute, chronic and mixed, were arbitrarily chosen for study. The acute type was considered present if a histologic section showed preponderance of polymorphonuclear cellular infiltration. The chronic type was noted if the sections showed lymphocytes, giant cells, small round cells and plasma cell infiltration. The mixed type consisted of sections in which the cellular elements common to the acute and chronic types were present in approximately equal proportions.

The source material consisted of 555 surgical specimens obtained from 641 consecutive pilonidal surgical procedures in the sacrococcygeal region over a period of six years (1943-1949) in a military general hospital. Only 2 of the patients were Negroes, which confirmed the low racial incidence already noted by other authors.[11] It is interesting to note that, of the surgical specimens obtained, only a few (56) were subjected to laboratory examination limited to gross description. Of this small group, almost three-fourths (71 per cent) revealed the presence of hair. which observation is in close agreement with that encountered in the microscopic analysis. This similarity should not imply that microscopic study is not necessary for confirmation of clinical diagnosis (see table).

Though all specimens submitted to the laboratory were grossly diagnosed as pilonidal sinus, microscopic tissue examination in a few (17) gave negative results for the presence of any pathologic change. When surgical specimens from patients with pilonidal disease are not submitted and when the laboratory examination of some specimens is limited to gross description, no histologic confirmation of the clinical diagnosis exists. Conclusions based on a series lacking this confirmation may have an inherent factor of a 3.5 per cent error. Malignancy, though rare,[12] has been reported as a complication of pilonidal disease,[2b] the diagnosis having been discovered only by microscopic examination.

Histologic Data of Initial Cases.—Kooistra[2c] reported hair in 52 per cent of 89 sections examined. The present study revealed it to be present in almost three-fourths (72 per cent) of 422 sections. Epithelium was present (44 per cent) and absent (56 per cent) in roughly equal proportions. The ready destruction of epithelium by inflammation[2c] as compared to the resistance of hair to the same process explains the difference in incidence of the two components. Chronic inflammation was the predominant type of reaction present (60 per cent), with the mixed type (38 per cent) and the acute type (2 per cent) following in order. The sound principle of not subjecting an acutely inflamed area to radical operation[13] explains why so few surgical specimens were submitted which revealed this latter type of reaction. Some specimens (82) did not display either epithelium or hair but consisted entirely of inflammatory tissue. These sections, about 17 per cent of the series, were classified as confirming the diagnosis of pilonidal sinus in spite of the absence of dermal products. Had they not been so listed, the statistical error of 3.5 per cent would be raised to 22 per cent. From the foregoing description and statistical analysis, it is reasonable to assume that microscopic examination of an initial pilonidal sinus will show hair, chronic inflammation and an epithelial-lined sinus tract, in order of frequency.

Histologic Data in Cases of Recurrence.—Of the group examined (77), less than one-half (43 per cent) demonstrated hair. This incidence is not as great as that reported by Kooistra,[2c] who noted hair as present in 9 of 12 cases. Epithelium was noted in only 19 per cent. The destruction by inflammation plus extirpation at the time of the initial operation may ex-

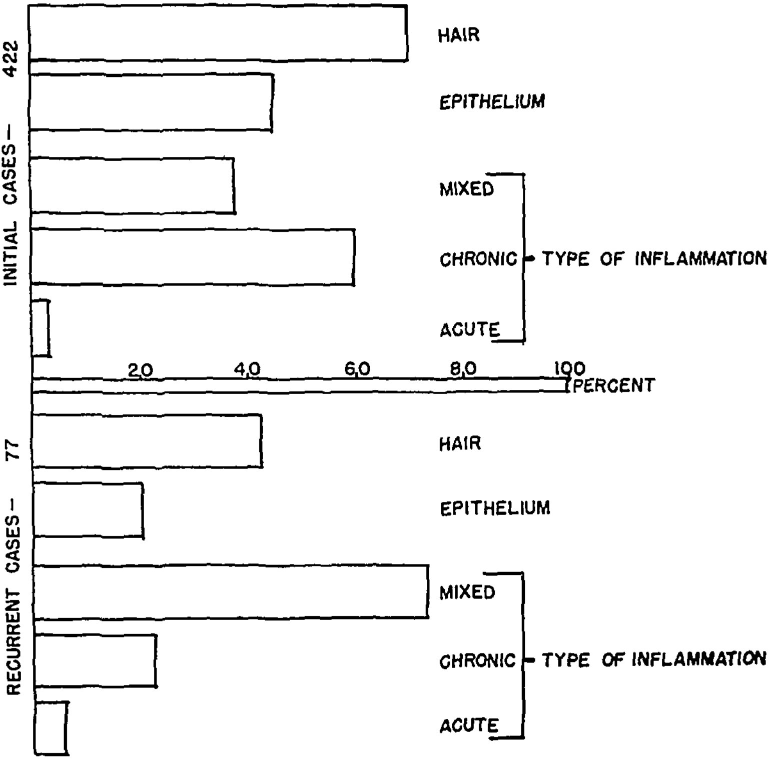

Chart 1—Histologic component incidence

plain the low dermal component incidence found in these specimens The type of inflammation present was noted to be mixed (74 per cent), chronic (22 per cent) and acute (4 per cent)

Histologic Comparison of Initial and Recurrent Pilonidal Sinus—It is now possible to note the frequency in appearance of histologic components in the two main groups of pilonidal entities (Chart 1) It is apparent that the incidence in initial cases of hair (72 per cent) and epithelium (44 per cent) is reduced in recurrent cases (43 per cent and 19 per cent respectively) Chronic infection formerly present in initial cases (60 per cent) is reduced in recurrent cases (22 per cent) and is replaced in order of frequency by a mixed type of inflammation (74 per cent) The difference in histologic component incidence between the initial and recurrent specimens has

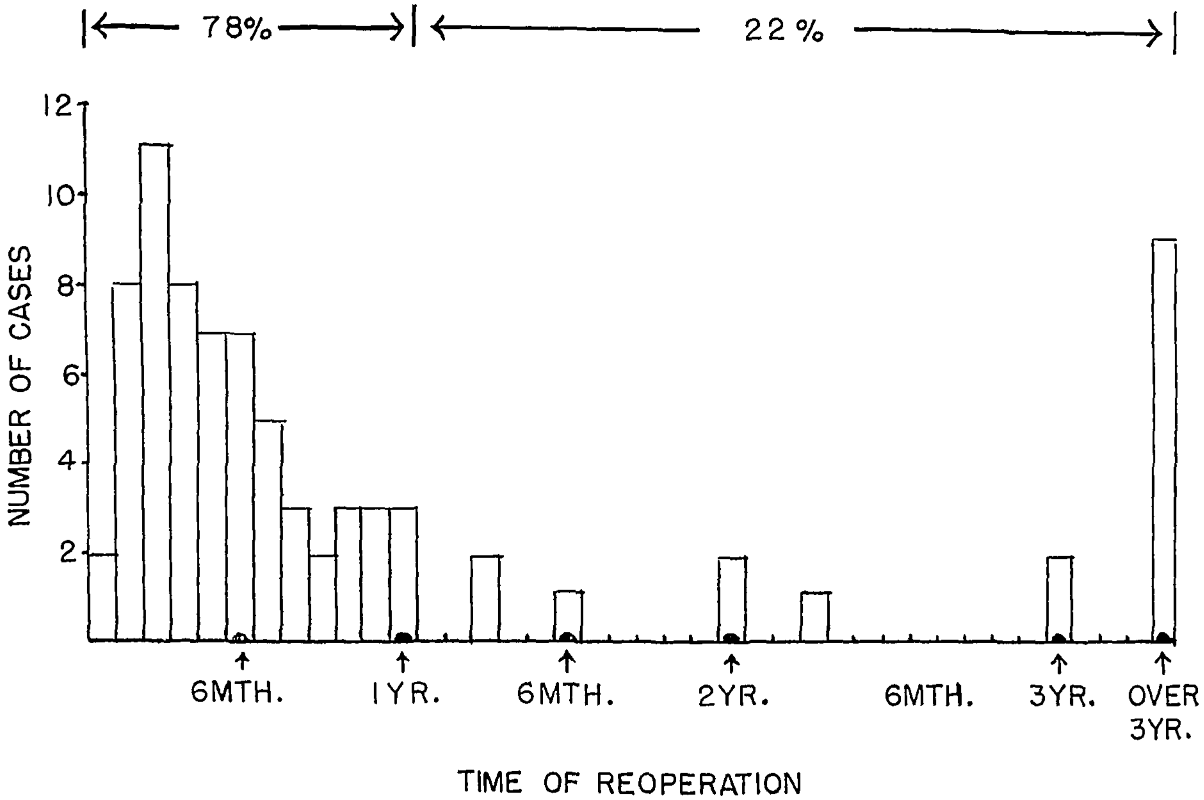

Chart 2.—Reoperation time graph.

ematically proved to be statistically significant.[13a]

Comment.—Conclusions based on the study thus far reported may be criticized for two reasons. It might be argued that the treatment of the source material is faulty, since no specimens were studied by serial section. Had this been done, the statistical figures thus far obtained might be appreciably altered. This argument is not completely true in respect to the present series, for of 499 surgical specimens sectioned, 1,759 slides were prepared for an average of approximately 3 sections per specimen. Judgment in normal laboratory practice dictates that sections be taken from areas of evident pathologic change. A minimum of two such areas in each specimen was chosen for section and one or more slides prepared from each. In this respect there was a rough approximation to the ideal of serial section study. In addition, all slides in the present series that did not reveal all of the components of hair, epithelium and inflammation were reviewed. It is felt that, until an analysis employing serial section procedures is done, such conclusions as may be drawn from the present study may act as a guide in the consideration of pilonidal sinus disease.

Another possible criticism of this study is based on the observation that hair and epithelium are destroyed by inflammation[11] and that, since inflammation is a part of the recurrent pilonidal sinus condition,[3b] it is to be expected that recurrent pilonidal sections will fail to reveal hair or epithelium. This argument was negated by the following study, which reveals that hair and epithelium are still evident in section, though inflammation has been present for three or more years. This conclusion was reached on the basis of the following observations:

1. The great majority of reoperations

are done within one year after the initial operation (Chart 2) This observation holds true only for military surgery and has little significance for application to civilian life The majority of patients who undergo reoperation have had inflammation present for less than one year, and it is in this postoperative period that the destruction of hair and epithelium is assumed to have taken place 2 A study was then done of surgical specimens obtained at the initial operation from patients with a clinical history of inflammation and drainage one or more years' duration (Chart 3)

Both hair and epithelium were noted to be present after a period of three years of intermittent inflammation It is concluded that these dermal components are not readily destroyed and in the majority of cases persist in the presence of inflammation for a minimum of at least three years

The problem of recurrence from the pathologic standpoint is now resolved into two etiologic sections Since hair and epithelium have been demonstrated to persist in the presence of inflammation, their presence in a section taken from an excised recurrent pilonidal sinus implies that initial extirpation was incomplete Since these components were found in a minority of recurrent sections, it must follow that epithelial remnants may well have etiologic significance in the initiation of recurrence, though not to the ex-

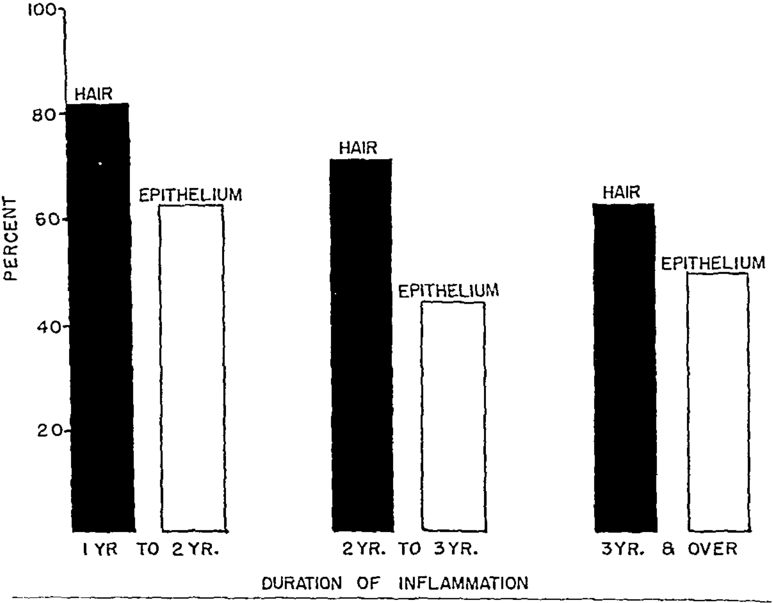

Chart 3—Initial pilonidal sinus, hair epithelium persistence

tent heretofore assumed. The explanation for recurrence in the majority of cases requiring reoperation must be found in factors not concerned with initial incomplete excision of pilonidal tissue. For an evaluation of these other factors, a clinical study of the surgery of pilonidal disease was made.

CLINICAL PICTURE

A discussion of the factors involved in the recurrence rate of pilonidal disease can cover many fields. The use of sclerosing solutions,[15] catheter emplacement[16] and "medical" management[17] have all been reported as means of reducing the recurrence rate. This section will discuss certain aspects of a surgical operative technic which has reduced the rate of recurrence.

In the main, two operative technics are used in the excision of pilonidal tissue. The primary closure technic requires that the wound be closed immediately so that healing may occur by primary intention. The open method dictates that the surgical wound be permitted to heal by secondary intention. An intermediate type of closure consists of narrowing the surgical wound by partial approximation and then permitting healing by secondary intention to take place in the remaining portion. This has been included in the present study under the open type technic. The present series consists of 251 cases with follow-up data, classified as to the particular surgical technic used.

Recurrence Rates.—The determination of recurrence rates does not have to be qualified as to time, for recurrence rate percentage can only increase with the passage of time. However, an analysis noting the rate of nonrecurrence that is based on a series with less than one year's lapse of time after operation should be evaluated with caution.[10a] If reoperation was indicated for patients initially treated by primary closure, it was usually done within one year. The same was true for patients treated by "open methods" (Chart 4).

A significant number of reoperations are done, however, after one or two years. Any postoperative evaluation from a nonrecurrent standpoint can be statistically significant only if the series has a follow-up period of at least two years. Primary closure was carried out on 174 cases in this series, with a recurrence rate of 38 per cent. The percentage is similar to that reported by MacFee[11b] (32.3 per cent) and differs from that reported by Kleckner[8] (23.29 per cent) and Larsen[18] (3 per cent). In 77 cases the open method was used, with a recurrence rate of 22 per cent. This percentage approximates the figures of Rogers[19] (18 per cent), while differing with those of Kleckner[8] (1.13 per cent). The present study revealed that primary closure procedures show a higher rate of recurrence than the open method, an observation supported by previously published reports.[20] Notwithstanding this higher rate of recurrence, primary closure is frequently employed because of the short period of hospitalization and early return to gainful activity.[21] In a series of 312 surgical procedures, twice as many (60 per cent) were done by the primary method as by the open technic. That the recurrence rate for the primary technic can be lowered is possible, for some investigators have reported low recurrence rates with this method.[18]

Analysis of Primary Technic.—Investigators reporting on the primary closure technic emphasize the surgical principle of apposition of the wound margins without tension, together with the elimination of dead space, as necessary for prompt healing. To achieve these objectives, articles have been published describing minimal excision of normal tissue,[22] flaps,[23] tissue mobilization at various planes,[24] skin grafts,[25] and closure in layers.[18] The present series was examined to determine the rate of recurrence when mobilization of the fascial plane tissue was done. The level of fascial mobilization was selected as that between the deep fascia and the underlying muscle mass. All technics in which mobilization was done at any other level were arbitrarily classified as nonmobilized. In all cases in

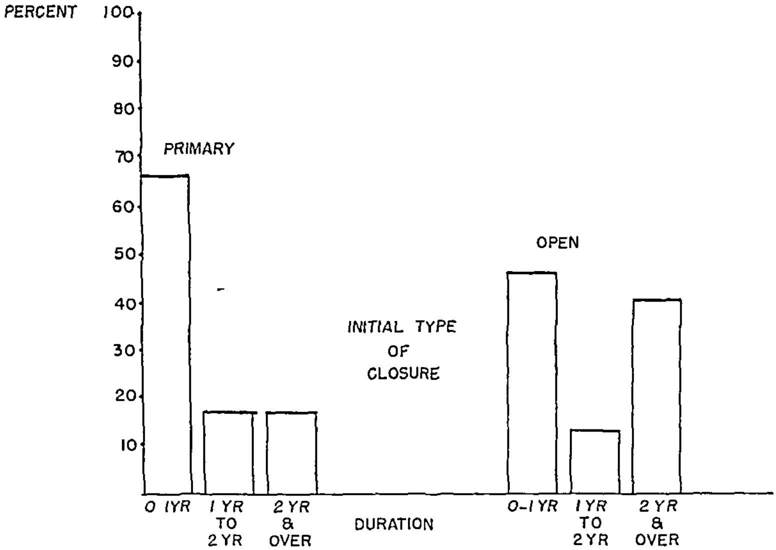

Chart 4—Pilonidal sinus, postoperative duration before reoperation

which the fascia was mobilized at the gluteal level, a lower rate of recurrence was demonstrated in contrast to the non-mobilized cases

Reports of surgical technic were available for study in 109 procedures with primary closure The fascia was mobilized in 62 of these The recurrence rate, with a follow up of two or more years' duration, is shown in Chart 5 It was also noted that of those cases which recurred though mobilization was done,[10b] catgut sutures were used for tissue approximation in many It is felt that had wire sutures been used the incidence of recurrence might have been lower and the advantages of fascial mobilization made more apparent

Analysis of Open Technic—This method was limited as a rule to cases with a history of one or more years inflammation, or where previous primary closure had been followed by failure There were 22 cases of the 77 with a history of failure following primary closure These cases were treated by the open method at the time of the second operation and no recurrence was noted in a follow up period covering six months to two years The technic used consisted of suturing the skin margins of the surgical wound to the base of the defect as reported by MacFee[11b]

Comment—The recurrence rate can be reduced by the use of proper technic in closure Before this can be done the extent of the pathologic tissue to be excised must be defined and limited "[6]

This may be done by comparing the color and character of the pale fibrotic pathologic tissue with the yellow color and firm consistency of the adjacent normal tissue The use of methylene blue has been abandoned "[7] Complete extirpation of the sinus tract should be [illegible] e, [illegible] gh pri-

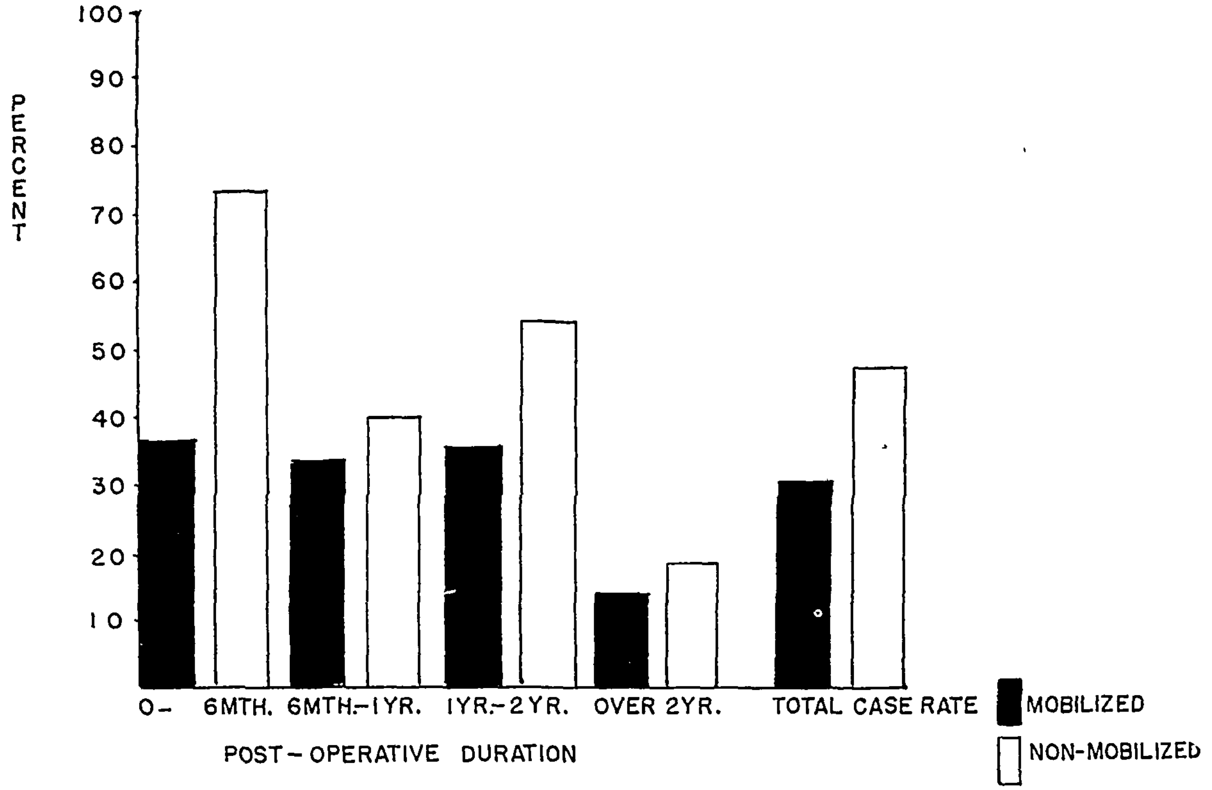

Chart 5.—Recurrence rate in mobilized and nonmobilized technics.

mary healing can still occur in the face of incomplete excision. Healing by primary intention has been present for ten months in 1 case and for two years in another, and surgical section examination in each case showed the sinus tract to open on the excision site.

The problem of wound closure cannot be solved by any one surgical method,[7a] but with proper selection of cases the advantages of primary closure over those of the open method may be utilized. Primary closure should not be done when there is a history of prolonged inflammation or when acute inflammation is present. Neither should it be used when failure has followed operation for pilonidal sinus. Primary closures must obliterate dead space, without gross approximation tension. The best means of attaining these objectives is by technics utilizing mobilization of the fascia immediately overlying muscle masses. Wound closure in obese persons must be done with care in order to prevent the formation of an ischemic scar. Minute fissures are prone to occur in these scarred areas because of trunk motions, and in time there develops an indolent ulcer which is resistant to conservative treatment. This type of case is usually classified as recurrent, the cause being due to failure in technic. The type of suture material used in closure and the technic of excision should be such as not to leave a nidus buried which may later induce a foreign body reaction.[28] Of 12 sections in the present series demonstrating foreign body reaction, catgut suture inclusions were noted in 10 and inclusions of black silk material in 2. Dunphy[29] has reported in detail on the reaction that is frequently encountered with the use of catgut. If ligature for hemostasis is necessary, a non-necrotizing emplacement is indicated, and wire suture is the material of choice. Skin margins must be approximated with meticulous care, for if continuity in apposition is disturbed, a sinus tract will form almost invariably. The pressure of the dressing should be uniform, moderate and not subject to variation except by the surgeon.

SUMMARY

A series of 499 pilonidal surgical specimens were histologically analyzed. Of the 422 specimens from initial surgical cases, 72 per cent contained hair, 44 per cent revealed epithelium and 60 per cent showed chronic inflammation. Of the 77 surgical specimens obtained from recurrent disease, 43 per cent contained hair, 19 per cent revealed epithelium and 74 per cent showed a picture of mixed inflammation.

Hair and epithelium are resistant to inflammation and can be found in over 50 per cent of surgical specimens obtained from patients with a history of intermittent inflammation of three or more years' duration. The presence of hair or *epithelium in a surgical specimen from a* patient with recurrent pilonidal disease is evidence of incomplete extirpation of pilonidal tissue at the time of the initial *operation.*

Surgical specimens from recurrent pilonidal sinuses displayed hair and epithelium in 40 per cent of the sections. Recurrence may have been due in this 40 per cent group to incomplete excision at the time of the initial operative procedure, but in the remaining sections no hair or epithelium was noted.

Clinical factors producing recurrence were studied in a series of 251 operative procedures. For the 174 cases of primary closure the recurrence rate was 38 per cent. Of the 77 cases of closure by secondary intention, the recurrence rate was 22 per cent.

Survey Analysis

	No. of Cases	Per Cent
1 Surgical Procedures Noted	641	100
Laboratory specimens submitted	555	86 58
Laboratory specimens not submitted	86	13 42
2 Initial Surgical Cases	555	100
Laboratory specimens submitted	478	86 12
Laboratory specimens absent	77	13 88
3 Recurrent Surgical Cases	86	100
Laboratory specimens submitted	77	89 53
Laboratory specimens absent	9	10 47
4 Total Laboratory Specimens Submitted	555	100
Total complete descriptions	499	89 91
Total gross descriptions	56	10 09
5 Total Complete Descriptions	499	100
Clinical diagnoses verified	482	96 6
Clinical diagnoses not verified	17	3 40

The recurrence rate for primary closure is reduced when mobilization of fascia is carried out prior to closure of the wound. In 30 per cent of 62 cases the condition recurred, when mobilization of fascia was done as a step in primary closure technic. In 47 per cent of 47 cases recurrence took place when this step was not done in primary closure. The use of wire for sutures and ligatures will also reduce the rate of recurrence.

Open procedures are recommended for patients with an inflammation present a year or more, or when previous attempt at primary closure has failed. Twenty-two patients with a history of failure after primary closure were treated by open methods at the time of reoperation, and there has been no recurrence.

Surgical specimens obtained from patients operated on for pilonidal sinus should be submitted to the laboratory for complete histologic examination.

CONCLUSIONS

1. Primary closure employing fascia mobilization has a lower incidence of recurrence as compared with non-mobilized primary closure.
2. The primary closure technic should be limited to patients having a history of less than one year's duration of inflammation.
3. Reoperation in cases of recurrence should be limited to one of the open type technics.

RÉSUMÉ

L'auteur fait l'analyse histologique d'une série de 499 spécimens pilonidal. Parmi les 422 premiers spécimens, 72% contenaient des cheveux, 44% de l'épithélium et 60% présentaient de l'inflammation chronique. Parmi les 77 cas de récidive, 43% contenaient des cheveux, 19% de l'épithélium, 74% de l'inflammation chronique.

Les cheveux et l'épithélium sont très résistants à l'inflammation et peuvent se trouver dans 50% des cas remontant à trois années et plus. S'il y a présence de cheveux et d'épithélium dans les cas de récidive, c'est que l'extirpation initiale du kyste a été incomplète. Les coupes histologiques des cas récidivants montrent des cheveux et de l'épithélium dans 40% des cas. La récidive dans le groupe à 40% peut avoir été la conséquence d'une extirpation incomplète, on note cependant qu'il n'y a pas de cheveu ni d'épithélium dans la balance des cas.

Une étudeclinique des récidives a été faite pour 247 cas opérés. Des 174 cas, traités par fermeture primaire, il y eut 37% de récidive. Des 77 cas à fermeture secondaire, il y eut 22% récidive.

On peut réduire la récidive dans les cas guéris par première intention si l'on a soin de libérer le fascia avant de fermer. Malgré cette manoeuvre, il y eut récidive dans 30% des 62 cas. 47% des 47 cas où cette précaution ne fut pas prise, récidivèrent.

La récidive diminue aussi si l'on a soin de se servir de fil d'acier comme matériel.

On recommande le débridement dans les cas de longue durée ou lorsqu'il y eut échec. 22 patients de cette catégorie ont bénéficié de cette méthode.

On doit soumettre à l'examen histologique tous les spécimens de kystes pilonidaux enlevés.

CONCLUSIONS

1. La récidive est plus rare si on a soin de libérer le fascia dans les cas où l'on ferme immédiatement que chez ceux où on ne pratique pas ce procédé.
2. La fermeture immédiate est réservée aux cas où l'inflammation dure depuis moins d'un an.
3. Les cas de récidive doivent être opérés par une méthode de débridement ouvert.

ZUSAMMENFASSUNG

Es wird eine Serie von 499 chirurgischen Praeparaten von Pilonidalzysten histologisch untersucht. Unter 422 Praeparaten von erstmaligen chirurgischen

Faellen fanden sich 72%, die Haare enthielten, 44% die Epithel zeigten und 66% mit Zeichen chronischer Entzuendung Von den 77 chirurgischen Praeparaten rueckfaelliger Erkrankungen enthielten 43% Haare, 19% Epithel und 74% Zeichen gemischter Entzuendung

Haare und Epithel halten der Entzuendung stand und koennen in ueber 50% der chirurgischen Praeparate, die von Faellen mit einer drei-oder mehrjaehrigen Geschichte wiederholter Entzuendung stammen nachgewiesen werden Die Anwesenheit von Haaren oder Epithel im chirurgischen Praeparat rueckfaelliger Kranker ist der Beweis unvollstaendiger Entfernung des pilonidalen Gewebes beim ersten chirurgischen Eingriff

Die chirurgischen Praeparate von rueckfaelligen Erkrankungen zeigten Haare und Epithel in 40% der Schnitte In dieser Gruppe von 40% mag das Wiederauftreten der Erkrankung auf unvollstaenige Resektion bei der ersten Operation zurueckzufuehren sein, in den uebrigen Schnitten aber wurden weder Haare noch Epithel gefunden

An einer Gruppe von 247 operativen Eingriffen wurden die zu Rueckfaellen fuehrenden klinischen Faktoren untersucht Unter den 174 Faellen, die primaer geschlossen wurden, war der Prozentsatz der Rueckfaelle 37 Von den 77 Faellen mit skundaerer Heilung trat ein Rueckfall in 22% auf

Die Haeufigkeit der Rueckfaelle bei primaerem Verschluss kann herabgesetzt werden, indem vor der Schliessung der Wunde eine Mobilisierung der Faszie ausgefuehrt wird Unter 62 Faellen wurde ein Wiederauftreten der Erkrankung in 30% beobachtet, nachdem eine Faszienmobilisierung der primaeren Wundschliessung vorangegangen war In 47 Faellen, wo diese Vorsichtsmassnahme unterlassen wurde, kam es in 47% zu Rueckfaellen Die Verwendung von Draht fuer Naehte und Ligaturen traegt ebenfalls zur Verminderung der Rueckfallsrate bei

Offene chirurgische Verfahren werden in Faellen mit ein oder mehrjaehriger Entzuendung oder in Faellen, wo vorher ein primaerer Verschluss versagt hat, empfohlen Unter 22 Kranken, bei denen der primaere Verschluss versagt hatte, und die dann bei der Nachoperation mit der offenen Methode behandelt wurden, trat kein einziger Rueckfall auf

Die von Kranken mit pilonidaler Fistel gewonnenen Operationspraeparate sollten einer genauen histologischen Untersuchung im Laboratorium unterzogen werden

SCHLUSSFOLGERUNGEN

1 Der primaere Verschluss mit gleichzeitiger Mobilisierung der Faszie zeitigt eine geringere Haeufigkeit von Rueckfaellen als der Eingriff ohne Mobilisierung

2 Die Anwendung der primaeren Verschlusstechnik sollte auf diejenigen Kranken beschraenkt werden, die weniger als ein Jahr lang unter Entzuendungserscheinungen leiden

3 Bei Nachoperationen rueckfaelliger Kranker sollten ausschliesslich offene Operationsmethoden angewandt werden

RESUMEN

Se analizo histologicamente una serie de 499 muestras quirurgicas pilosas En 422 muestras de casos quirurgicos iniciales el 72 % contuvo pelo, el 44 % revelo epitelio y el 60 % mostro inflamacion cronica En 77 muestras quirurgicas obtenidas de casos recidivantes el 43 % contuvo pelo, el 19 % revelo epitelio y el 74 % mostro un cuadro de inflamacion mixta

Pelo y epitelio son resistentes a la inflamacion y pueden encontrarse en mas del 50 % de las muestras quirurgicas, obtenidas de casos con antecedentes de tres o mas años de inflamacion intermitente Su presencia en una muestra quirurgica de caso recidivante es evidencia de la extirpacion incompleta del tejido piloso al operarse inicialmente

Muestras quirurgicas de casos recidivantes mostraron pelo y epitelio en el 40 % de los cortes En este grupo puede deberse la recidiva a excision incompleta al operarse inicialmente, pero en los cortes

restantes no se notó ni pelo ni epitelio.

Se estudiaron los factores clínicos productores de recidiva en una serie de 247 procedimientos operatorios. En 174 casos cerrados primariamente el índice de recidiva fué del 37 %. En 77 casos cerrados por segunda intención el índice de recidiva fué del 22 %.

El índice de recidiva en los cierres primarios se redujo cuando se efectuó movilización de la aponeurosis antes de cerrar la herida. En el 30 % de 62 casos ocurrió la recidiva, cuando la movilización de la aponeurosis tuvo lugar preliminarmente en la técnica de cierre primario. En el 47 % de 47 casos hubo recidiva cuando esto no se hizo en el cierre primario. El uso de alambre para sutura y ligadura reducirá también el índice de recidiva.

Se recomiendan los procedimientos abiertos en casos con antecedentes inflamatorios de uno o más años de duración, o cuando fracase el intento previo de cierre primario. Veintidos pacientes con antecedentes de fracaso consecutivo al cierre primario se trataron con métodos abiertos al ser reoperados y no hubo ninguna recidiva.

Muestras quirúrgicas obtenidas de pacientes operados por senos pilosos se enviaron al laboratorio para examen histológico completo.

CONCLUSIONES

1. El cierre primario empleando movilización aponeurótica tiene una baja incidencia de recidiva comparado con el cierre primario sin movilización.
2. La técnica del cierre primario debe limitarse a pacientes con antecedentes inflamatorios de menos de un año de duración.
3. Debe limitarse la reoperación en casos recidivantes a una de las técnicas de tipo abierto.

RIASSUNTO

Una serie di 499 mostre chirurgiche pilonidale furono analizzate istologicamente. Dei 422 specimen di casi chirurgici iniziale, 72% contenevano capelli, 44% rivelavano epitelio e 60% mostravano infiammazione cronica. Dei 77 pezzi chirurgici ottenuti da casi recidivi, 43% contenevano cappelli, 19% rivelavano epitelio e 74% mostravano un quadro d'infiammazione mista.

Capelli ed epitelio sono resistenti ad infiammazione e possono trovarsi in sopra di 50% dei pezzi chirurgici ottenuti da casi colla storia di durata di tre anni o piú d'infiammazione intermittente.

La presenza di capelli od epitelio nello pezzo chirurgico da un caso recidivo e' prova d'estirpazione incompleta del tessuto pilonidale al momento della chirurgia iniziale.

Mostre chirurgiche dai casi recidivi facevano vedere capelli ed epitelio in 40% delle sezioni. Recidivo pote'essere convolevole in questo gruppo di 40% ad eccizione incompleta al tempo di chirurgia iniziale, ma nella sezioni rimanente non si notava capelli ad epitelio.

Fattori clinici producendo recidivo furono studiati in una serie di 247 procedimenti chirurgici. Dei 174 casi serrati primitivamente, il rango recidivo fu 37%.

Dei 77 casi chiusi ad intenzione secondaria, il rango recidivo fu 22%.

Nelle chiurure primarie il rango recidivo e' abbassato quando mobilita' della fascia e' adottata priore alla chiusura della ferita. In 30% dei 62 casi la condizione ricorreva quando mobilitazione della fascia fu fatta come un passo nella tecnica della chiusura primaria. In 47% dei 47 casi recidivo accade' quando questo passo non fu fatto nella chiusura primaria L'impiego di filo metallico per sutura e legatura anche abbassera' il rango recidivo.

Procedimenti scoperti sono raccomandati nei casi colla storia di durata d'infiammazione un anno o piu' o quando l'attentato precedente a chiusura primaria falli'. Ventidue pazienti con anamnesi di fallimento seguente chiusura primaria furono trattati da metodi scoperti al momento di rioperazione senza ricorso.

Mostre chirurgiche attenuti da pazienti operati per seno pilonidale dovrebbero

essere sommessi al laboratorio per esamina istologica completa

CONCLUSIONI

1 Chiusura primaria impiegando mobilitazione fasciale ha incidenza piu' basso a paragone di chiusura primaria senza mobilita'

2 La tecnica di chiusura primaria dovrebbe essere limitata ai pazienti avendo la storia d'infiammazione meno durata d'un anno

3 Rioperazione su casi recidivi dovrebbe essere limitata ad un tipo di tecnica scoperta

SUMARIO

Uma serie de 499 especimes de cistos pilosos foi histologicamente examinada Entre 422 especimes de casos cirurgicos iniciais, 72 por cento continham cabelo, 44 por cento revelaram epitelio e 60 por cento evidenciaram inflamaçao cronica Entre os 77 especimes cirurgicos obtidos de casos recurrentes, 43 por cento continham cabelo, 19 por cento revelaram epitelio e 74 por cento demonstraram inflamaçao mista

Cabelo e epitelio são resistentes a inflamaçao e podem ser encontrados em mais de 50 por cento de especimes obtidos de casos com uma historia de 3 ou mais anos de duração ou de inflamação intermitente A presença de cabêlo ou epitelio em um especime cirurgico de um caso recurrente revela extirpação incompleta do tecido piloso por ocasiao do ato cirurgico inicial

Especimes cirurgicos de casos recurrentes não possuiam cabelo e epitelio em 40 por cento dos cortes histologicos, A recurrencia pode ter se dado neste grupo devido a incompleta excisão durante o ato cirurgico inicial, mas nos remanescentes cortes nenhum cabelo ou epitelio foi notado As causas clinicas productoras de recurrencia foram estudadas n'uma serie de 247 operaçoes Nos 147 casos primarios em que se praticou o fechamento primario a taxa de recurrencia foi de 37 por cento

Entre os 77 casos cicatrizados por segunda intencao, a taxa de recurrencia foi de 22 por cento

A taxa de recurrencia em fechamento primario e reduzida quando a mobilização do fascia e executada antes do fechamento da ferida Em 30 por cento de 62 casos de recurrencia houve contudo mobilizaçao previa do fascia Em 47 por cento de 47 casos de recurrencia foi observado que a mobilizaçao previa do fascia nao havia sido praticada O uso de arame para sutura e ligadura reduz tambem a taxa de recurrencia

Processos abertos sao recomendados em casos nos quais se registra inflamacão de mais de um ano ou quando a tentativa de fechamento primario fracassou 22 pacientes com uma historia de fracasso de fechamento primario foram tratados por processos abertos ao tempo da reoperação e não houve recurrencia em nenhum deles Os especimes cirurgicos obtidos de pacientes operados por cistos pilosos devem ser remetidos ao laboratorio para completo exame histologico

CONCLUSOES

1 O fechamento primario quando se emprega a mobilização do fascia tem uma taxa menor de recurrencia quando comparado com fechamento primario sem mobilização

2 A tecnica de fechamento primario deve ser limitada a pacientes com uma historia de menos de um ano de duração ou inflamação

3 A reoperacão nos casos de recurrencia deve ser limitada a uma das tenicas de tipo aberto

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> Every year we grow a knot, like the bough of a tree; some branch of our intelligence expands, or else it withers and hardens.
>
> —*Joubert*

Recurrent Inguinal Hernia

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ONE need never apologize for discussing recurrent inguinal hernia with any group of surgeons. All of us encounter it, and most of us admit, *although hesitantly, perhaps, that a few* recurrences follow our own repairs. The study of recurrent inguinal hernia presents a *practical surgical problem involving* anatomy, physiology, surgical technic, and the economic status of many persons under diverse circumstances. During the early years of this century the recurrence rate after inguinal hernioplasty was variously reported as ranging from 30 to 50 per cent. This certainly was a great factor in the deluge of surgical technics which have been offered to the surgeon for the safe and permanent repair of inguinal hernia, regardless of size or inguinal tissue dispersion, and the resultant inevitable statistics to prove each one *superior. The* numerous methods of repair bid fair to supersede those evolved for suspension of the uterus in midpelvic air, *to the satisfaction* of both surgeon and patient.

At present it is agreed by a large number of surgeons that the recurrence rate following inguinal hernia repair approximates 12 per cent, but here, unfortunately, one is confronted with the fact that many patients, when a hernia recurs after treatment, are inclined to seek a different surgeon to repair it.

Among the many factors contributing to the recurrence of inguinal hernia, the degree of knowledge of the operating surgeon must be considered. Unfortunately, in recent years the physiobiologic aspects of surgery have been overemphasized and the anatomic basis of surgical technic somewhat neglected; this handicaps many young surgeons by depriving them of a thorough fundamental knowledge of the structures to be repaired. All too often *the old aphorism of coaptation without* strangulation is thought to be too simple, an idea brought forth in sincerity but to be *disregarded with impunity. It is rather* astounding that many operations for hernia are assigned to junior house officers with the casual remark that their superiors are "too busy with more important operative procedures." Yet in no other field of surgery is there a greater need of basic knowledge, judgment, and surgical acumen needed than in the treatment of a complicated hernia.

The experience of most surgeons has revealed that the recurrence rate of direct inguinal hernia is much higher than that recorded for the indirect type. Some clinics report the direct rate up to 30 per cent, as compared with 7 to 12 per cent for indirect hernia. In general, one *finds the recurrence of direct inguinal* hernia in patients of the older age group accompanied by gradually developing *attenuation of the structures, obesity, mal*nutrition and a decreased fibroblastic reaction.

Among the predisposing causes, both immediate and delayed, of recurrent inguinal hernia of both types one must consider: 1. The type of repair attempted. Was it adequate primarily? 2. Was the technic faulty, resulting in hematoma, nerve injury, wound sepsis or dehiscence? 3. Was the convalescence interrupted by pulmonary infection with a resultant cough, or was the patient plagued by hiccoughs? 4. Was the nutritional level near par? 5. What type of work was done after the repair? This may constitute a definite hazard and invite recurrence.

One cannot assume a *dogmatic or arbitrary* view as to exactly what constitutes

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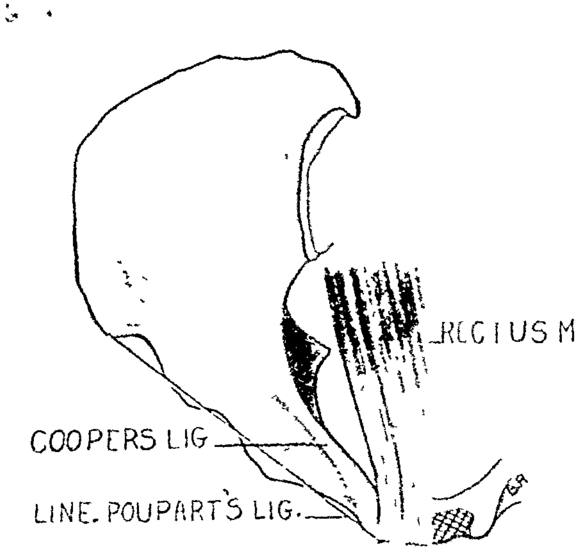

Fig. 1.—Relation of rectus tendon to Cooper's ligament and inguinal ligament. *(Holloway and Johnson, Western Journal of Surgery, Gynecology and Obstetrics, September 1948.)*

a recurrent inguinal hernia. The appearance of a hernial sac in the same location as that observed at the original operation may denote an aborted effort at high ligation of the hernial sac or, as has been noted on more than one occasion, no ligation at all. In 2 hernioplasties for recurrent hernia, to my amazement, a perfectly executed Bassini repair with cord transplantation was found, but the surgeon had forgotten to excise the sac and had transplanted the sac undisturbed with the cord. It is a rather general belief that, after a well executed high ligation of the inguinal hernia sac, it is rare—indeed, almost impossible—for the hernial sac to appear at the original site of exit, but the mere fact that this has occurred in one of my own primary repairs leads me to doubt such broad generalizations. This may be accounted for by pleading guilty to negligence in effecting a complete closure of an existing muscular or fascial defect at the internal inguinal ring.

It is rather significant that one may observe a recurrent inguinal hernia of the direct type in a patient who has undergone surgical repair of an indirect inguinal hernia only a few weeks earlier. This must lead one to conclude that at the original operation a direct hernia was present or a definite defect was coexistent in the transversalis.

The great problem encountered in cases of recurrent inguinal hernia is repair of the direct type. Most available statistics indicate that direct inguinal hernia constitutes about 10 per cent of all inguinal hernias, but for *recurrent* direct inguinal hernia the incidence is elevated to 50 per cent. The conclusion must be rather obvious; incomplete repair or failure to observe a defect in the inguinal floor eventuating in recurrence may account for a considerable part of this high rate. I am sure that many direct recurrences have followed an injudicious primary operation with superimposed surgical trauma.

In past years many surgeons in the United States and England have taught that indirect inguinal hernia, when treated by high ligation of the sac and extirpation, is cured in a high percentage of cases. This claim is being challenged by many who operated upon a great number of inguinal hernias during World War II. In many instances it was found, on careful examination, that congenital weakness prevailed in the inguinal bed embodying Hesselbach's triangle, and that unless proper attention was given to reinforcement one might prognosticate an early recurrence of the direct type of hernia.

In recent years, Anson and McVay, Harkins, Bartlett, and Fallis have familiarized the profession with the use of the transversalis fascia in inguinal hernioplasty. Fallis has correctly pointed out that in the presence of direct inguinal hernia the rectus muscle becomes contracted at its inferior attachment, and the external inguinal ring is enlarged; also, the internal oblique and transversus abdominis muscles do not become fibrous until they reach the rectus sheath. This lessens the possibility of a definite conjoined tendon, thus in part destroying one of the pillars of the temple of Bassini.

Anson and McVay have shown clearly

that the transversalis fascia does not attach to the inguinal ligament, but inserts into the ligament of Cooper (superior pubic ligament) (Fig. 1). This fact has led to the popular Cooper ligament operation for repair of both in inguinal and femoral hernias, which is rapidly replacing many of the former types of inguinal repair, and with justification, based on the lowered recurrence rates reported by surgeons in widely separated centers.

From a purely technical point of view one must consider the factors concerned in primary operation upon any inguinal hernia with reference to their influence on recurrence. One cannot but be impressed by the fact that many choices and decisions made by the surgeons, from anesthesia to ambulation, have a direct bearing on success or recurrence. Any set rules or standardized procedures for hernioplasty are doomed from the beginning unless they are flexible enough to meet all situations.

Time, statistics, and results have all contributed to adoption of the use of nonabsorbable suture material in preference to the absorbable type. It is granted that many successful hernioplasties have been done with absorbable sutures, but it is the considered judgment of most herniotomists that much more satisfactory results might have been obtained had nonabsorbable sutures been used, especially in view of the comparative recurrence rate.

As to anesthesia, it would be rather easy to eliminate this choice from the surgeon's decision and shift the responsibility to the anesthesiologist, but unfortunately most surgeons cannot do so. Trained anesthesiologists are in the minority; therefore it becomes a part of the surgeon's duty to select an anesthetic suitable for his needs. Many have used procaine hydrochloride block, but I have not found it easy to perform an extensive repair by this method, although it has many virtues. Inhalation anesthesia, especially with the gases combined with curare, has many advocates, as has intravenous pen-

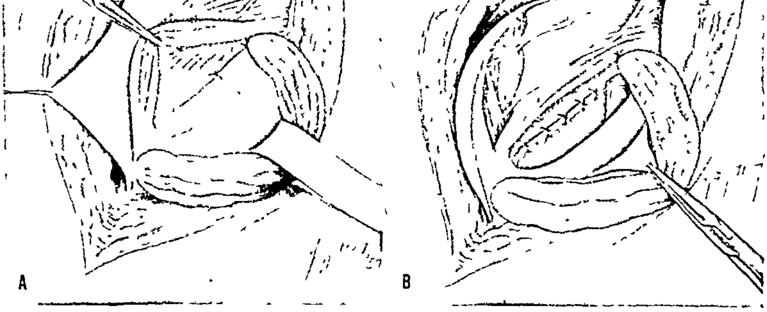

Fig 2—*A*, first suture placed in approximation of transversalis to C[illegible]t. *B*, suture of transversalis fascia to Cooper's ligament, including lacunar lig[illegible]se to femoral vein. Relaxing incision.

tothal and curare. Personally, I prefer spinal anesthesia combined with pentothal for most of my inguinal hernia repairs, because of its simplicity and safety, the muscular relaxation it affords, and the resultant decrease intra-abdominal tension.

Since World War II early ambulation has become a household word; newspapers and magazines have made it as popular as "having your baby without pain, fear or drugs." To most surgeons early ambulation seems both safe and desirable, in a restricted sense, after an inguinal hernioplasty. In my opinion the patient's wishes should be consulted to some extent. I have yet to be convinced that a surgeon who rushes into his patient's room on the morning after the operation with a large smile on his face and joyfully bids the patient arise and walk, will be welcomed with open arms. Early ambulation has many virtues, but discretion should not be silenced, for in many postoperative patients early ambulation may spell failure in much larger type than late ambulation. Of course, every patient's postoperative potential should be evaluated, but it has been my experience that patients whose postoperative stay has averaged ten days, seven days of which he has spent up and around in his room, are dismissed in better condition and much happier.

Obviously, one encounters many more complex conditions with recurrent inguinal hernia repair as compared with initial hernioplasty: distorted anatomic relations, nerve injury, muscular atrophy, extensive fibrosis, cord atrophy and at times extensive varicosities. It is probably well to divide recurrent inguinal hernias into two large groups from the point of view of surgical repair:

1. Recurrent inguinal hernia associated with tensive atrophy of the muscle and fascia, attenuation of the accompanying structures or nearly complete agenesis.

2. Recurrent inguinal hernia in which the tissues approach the normal except for placement, retention ability and fibrosis.

The first, with extensive atrophy and inseparability of the structures in the inguinal region, has been a challenge to herniotomists for decades, and all of us have lived through many procedures for the aid, comfort, and cure of the unfortunate patients.

Fascial grafts have been the perfect answer to the problem for many surgeons, filling the void from structure to structure and forming a firm retention barrier, but for many this procedure has not been too successful. Failure may not be chargeable to the method at all times, but in some instances poor selection and faulty technic contribute to its discrediting.

Cutis grafts and whole thickness grafts have brought gratifying results in operations for inguinal hernia when a large structural defect is present. One should remember that thorough preparation of the skin is a strict prerequisite for the graft, to eliminate wound infection which may negate a perfect repair.

Tantalum mesh, as advocated by Koontz and Throckmorton, seems to offer great possibilities in the closure of large inguinal defects. Its ease of sterilization, pliability, lack of unfavorable reaction when buried, ease of fitting in the defect, and supporting qualities for fibroblastic bridging must be considered in this type of repair. I have used it in the repair of large ventral hernias and recurrent inguinal hernias with complete agenesis, which had been previously repaired by less radical procedures. The results have been excellent, and I am encouraged to use tantalum mesh in the future for bridging structural defects.

During World War II there was a positive trend among many surgeons who served in military hospitals for a revision of the approach to inguinal hernia, both as to primary repair and the repair of recurrences. Primarily, I believe the reason for questioning the former approach was the flood of draftees who entered the armed services with inguinal hernias. Most surgeons mustered into military service had never before had the opportunity to observe and care for so many patients with inguinal hernias. The comparatively few seen in civilian practice or

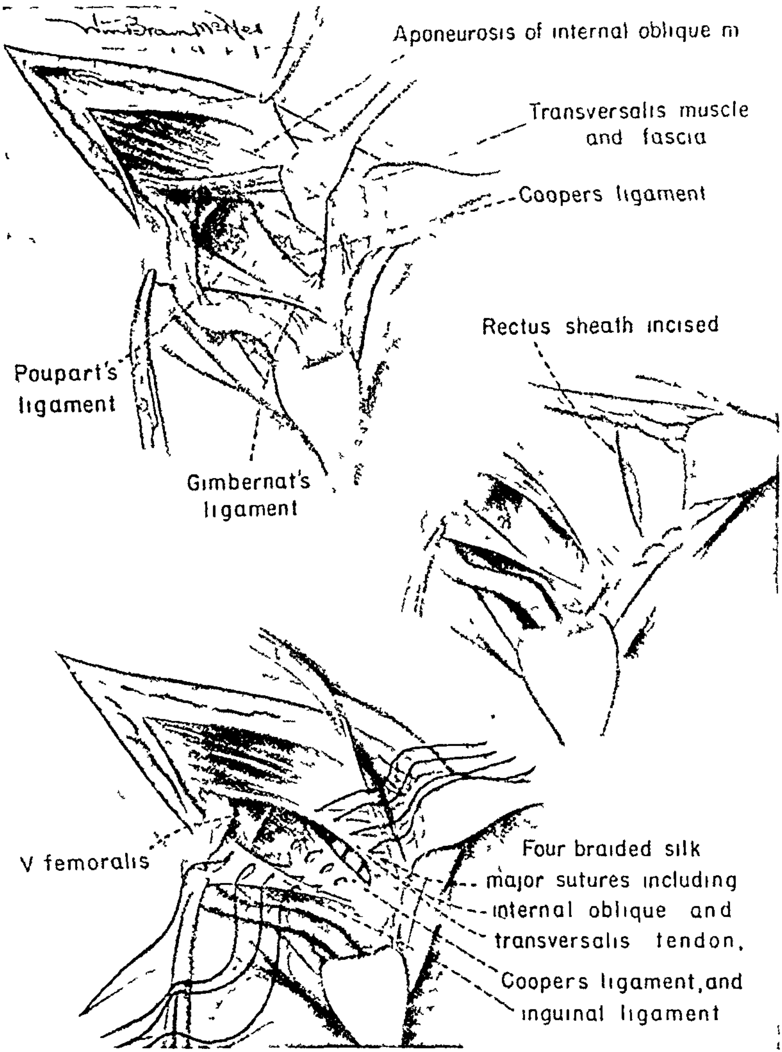
Aponeurosis of internal oblique m
Transversalis muscle and fascia
Coopers ligament
Rectus sheath incised
Poupart's ligament
Gimbernat's ligament
V femoralis
Four braided silk major sutures including internal oblique and transversalis tendon, Coopers ligament, and inguinal ligament

Fig 3 —*Upper left* superior pubic ligament exposed *Center right*, relaxing incisio recti sheath *Lower left* sutures approximating internal oblique and transversalis tendon ligament and inguinal ligament (*N S Rothschild Surgical Clinics of North Ame* 1947)

in large charity hospitals had offered no such control, comparison and opportunity for group study as were here amassed. Surgeons left the military service with varied conclusions, but all were stimulated to make a new evaluation of methods of inguinal hernia repair. Many became advocates of nonabsorbable suture material; others came home enthusiastic about the use of the transversalis fascia, and others, in great number, found Cooper's ligament to be a better "hitching post" than Poupart's, with all its years of service.

In studying a small group of recurrent inguinal hernias (Tables 1 and 2) in civilian practice, I became increasingly aware that the older conventional methods of inguinal repair for recurrent types of hernia, especially those most commonly used, might be improved. My chief concern was the repair of recurrent inguinal hernias in which the structural elements approached the normal except for placement, retention ability and fibrosis; in other words, the group more amenable to recurrent repair, the greater in number and yet probably the most poorly managed.

It has seemed to me, from a purely structural and mechanical point of view, that certain definite anatomic requirements become evident in the repair of recurrent inguinal hernias, whether direct or indirect, and that these are more important than may have been realized in the original hernioplasty. One must immediately think of the transversalis fascia as the first line of defense against increased intra-abdominal pressure; thought should be given to the restoration of its retaining power if possible, and, if this is impossible a substitute should be provided. It is common knowledge that the transversalis fascia loses its competence in Hesselbach's triangle in the presence of direct inguinal hernia and, to a lesser degree, in all recurrent inguinal hernias of the indirect variety between the epigastric vessels and the cord. It would therefore seem wise as an initial step to free and thoroughly expose this fascia from the superior margins of the internal inguinal ring down to the anterior pubic spine. In so doing the cremaster muscle should be partially sacrificed in the interest of good apposition of the medial and lateral margins.

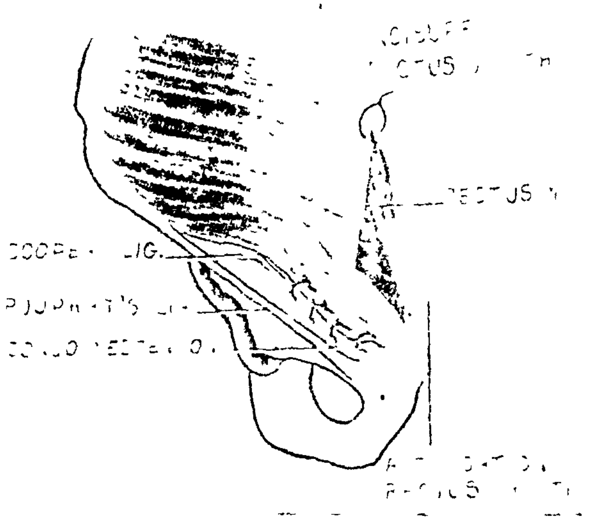

Fig. 4.—Relaxing incision of rectus sheath. Conjoined tendon sutured to Cooper's ligament. *(Holloway and Johnson, Western Journal of Surgery, Gynecology and Obstetrics, September 1948.)*

In most recurrent indirect inguinal hernias the transversalis fascia presents a definite disruption at the internal ring, which as a rule needs only simple reinforcement; yet it is neglected by many surgeons. In direct inguinal hernia the whole of the fascia must be reinforced throughout Hesselbach's triangle and sustained by a much more extensive reinforcement by the use of contiguous structures.

Prompted by the many failures of the time-honored Bassini operation and its dependence on the semimobile inguinal ligament, together with the absence, in some cases, of a conjoined tendon or the presence of a tendon that is incomplete save for a small portion at the lower reaches of the triangle of Hesselbach, I became interested in the Cooper ligament operation.

As far back as 1898, both Narath and Lotheissen advised the use of Cooper's ligament in inguinal and femoral hernioplasties, but it remained for Anson and McVay, on the basis of their anatomic studies, to point out some of the prevailing errors concerning the inguinal ligament and Cooper's ligament that the normal insertion of the inguinal strata is not the inguinal ligament but Cooper's ligament, and that the only relationship of the transversalis fascia transversus abdominis, and internal oblique aponeurosis to Poupart's ligament is by contiguity McVay has done much to popularize the Cooper ligament operation and prove its superior value Harkins in a thorough going report on 367 Cooper ligament operations did much to stimulate its use as a sound and effective procedure Holloway and Johnson have aided materially by their studies and by use of the Cooper ligament in conjunction with the lateral tendinous border of the rectus muscle in the repair of recurrent inguinal hernias

I have employed three variations of the Cooper ligament operation in repair of recurrent inguinal hernia in both direct and indirect recurrence In the first procedure (Fig 2) I have utilized the transversalis fascia as the basement of the canal by suturing it to the ligament of Cooper with a relaxing incision in the rectus sheath The second type of repair (Fig 3) has been accomplished by suture fixation of the transversalis fascia and conjoined tendon in combination to the ligaments of Cooper and Poupart The third variation in repair (Figs 4 and 5) has consisted of a relaxing incision in the rectus sheath followed by the apposition of the tendinous lateral margin of the rectus muscle to Cooper's ligament

TABLE 1 —*Survey of 48 Recurrent Inguinal Hernias*

Type	Number	Right	Left
Indirect	10	8	2
Direct	38	30	8
	—	—	—
	48	38	10

TABLE 2 —*Type of Primary Operation (48 Recurrent Inguinal Hernias)*

Operation	Number	Recurrence Time Months	Recurrence Time Years
Bassini	32		2½
Ferguson	2		2
Halsted	2		4
Hutchinson	1		1½
Andrews	3		7
Not identified	7		2
Cooper ligament	1	23	
	—		
	48		

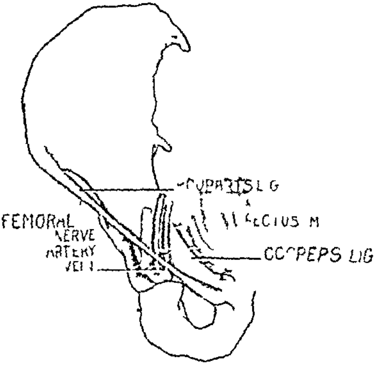

Fig 5 —Relation of femoral vessels to Cooper's ligament in operative repair of hernia (*Holloway and Johnson Western Journal of Surgery Gynecology and Obstetrics September 1948*)

There are several points that should be stressed with regard to any operative procedure for recurrent inguinal hernia 1 The sac in both the direct and the indirect hernia should be opened In the former the redundancy should be excised and the peritoneum sutured, in the latter, the incision makes for safer and higher ligation Inversion in either I do not believe to be good practice 2 When one visualizes the epigastric vessels without their normal covering of transversalis fascia, it is immediately obvious that a snug repair at the internal ring is necessary 3 If one is confronted with a direct sac accompanying an indirect hernia, the technic of Hoguet may be used By traction outward on the indirect sac, the peritoneum of the direct sac may be transposed lateral to the epigastric vessels, and the two sacs become as one 4 Should one fail in the

Hoguet maneuver, the epigastric vessels may be divided to achieve a more satisfactory repair. 5. Relaxing incisions are much more important than has been emphasized in the literature. 6. In all modifications of the Cooper ligament operation for recurrent inguinal hernia, clear exposure of the ligament is necessary, both for good apposition during insertion of the sutures and for avoidance of injury to the femoral vein or an anomalous vessel, such as the obturator artery, which is well known for its vagaries.

CONCLUSIONS

In the author's opinion the problem of recurrent inguinal hernia, so far as operative repair is concerned, may be substantially bettered by using tantalum mesh for hernias associated with loss of tissue or atrophy of the structures in conjunction with a Cooper ligament repair. For all others he advocates the use of cotton sutures but finds no fault with those who use silk, fascia or wire.

The amount of literature that has accumulated on the repair of inguinal hernia by use of the superior pubic ligament in hernioplasty makes it evident that excellent results may be obtained with the procedure.

CONCLUSIÓN

El autor cree que el problema de la hernia inguinal recidivante, por lo que se refiere a la reparación operatoria, puede mejorarse substancialmente con el uso de malla de tántalo para aquellas hernias con pérdida de tejido o atrofia de las estructuras, junto con la reparación con el ligamento de Cooper. Cree que en todas las demás el uso de suturas de algodón constituye una práctica quirúrgica perfecta, no encontrando criticable el uso de seda, fascia o alambre.

Resalta de la literatura acumulada sobre reparación de la hernia inguinal recidivante, utilizando el ligamento pubiano superior en hernioplastías inguinales, que pueden obtenerse excelentes resultados del procedimiento.

CONCLUSIONS

L'auteur prétend résoudre le problème de la récidive de l'hernie inguinale en se servant d'une trame de tantalum, surtout s'il y a perte de substance ou atrophie des plans avoisinant le ligament de Cooper.

Dans les cas usuels, l'usage du coton comme matériel est très recommandable; de même que la soie, le fascia ou le fil d'acier.

Si l'on étudie l'abondante litérature sur la réparation de l'hernie inguinale récidivante en se servant du ligament supérieur du pubis, les résultats d'herniorraphie sont excellents.

SCHLUSSFOLGERUNGEN

Der Verfasser glaubt, dass das Problem der chirurgischen Wiederherstellung des Leistenbruchs erheblich vereinfacht werden kann, wenn in den mit Gewebsverlust oder-atrophie einhergehenden Faellen das Tantalumnetz in erbindung mit der Wiederherstellung des Cooperschen Ligaments zur Anwendung gelangt. In allen anderen Faellen haelt er den Gebrauch von Baumwollnaehten fuer ein wohlbegruendetes chirurgisches Verfahren, von dem gute Resultate erwartet werden koennen, und hat gegen die Verwendung von Seide, Faszie oder Draht nichts einzuwenden.

Aus dem Umfang der sich anhaeufenden Literatur ueber die Verwendung des oberen Schambeinbandes bei der Reparatur von rueckfaelligen Leistenbruechen geht hervor, dass dieses Verfahren zu ausgezeichneten Ergebnissen fuehrt.

CONCLUSIONI

L'A. crede che il problema di ernia inguinale ricorrente, fino al riparo operativo, si possa migliorare sostanzialmente usando garza tantalo per quelle ernie con perdita di tessuto o atrofia delle strutture in congiunzione col riparo del lagamento COOPER. In tutti gli altri crediamo che l'impiego di suture di cotone sia pratica sana chirurgica ad effettuare il riparo, e non troviamo colpa in coloro che usano seta, fascia o filo metallico.

Evidentemente della somma di letteratura ammontato sul riparo di ernia in*guinale ricorrente utilizzando il legamento* pubico superiore nell 'ernioplastie inguinali, risultati eccellenti si possono ottenere dal procedimento.

SUMÁRIO E CONCLUSÕES

Na opinião do autôr o problema da hernia inguinal recurrente, no que diz respeito a reconstitução cirurgica, pòde ser substancialmente melhorado com o uso da malha de Tantalum para os casos de hernia associada com perda de tecido ou atrofía das estructuras, em conjuncão com uma reconstituicão auxiliada pelo ligamento de Cooper. Para todas as outras ele advóga o uso de suturas de algodão mas não se põe contrário ao emprego de sêda, fascia ou arame.

A literatura acumulada sobre reparação de hernia inguinal recurrente com o uso do ligamento pubico superior em hernioplastía torna evidente que os melhores resultados podem ser obtidos com esta técnica.

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drochloride (0.5 per cent), butyn sulfate (2 per cent), or holocaine hydrochloride (1 per cent) in the order named, are most satisfactory. The anesthetic effect of cocaine is excellent, but dilatation of the pupil follows its instillation, and in elderly persons, dessication of the corneal epithelium frequently occurs. Appropriate hypnotics may be administered to produce analgesia, but demerol also may be employed if necessary. General anesthesia is rarely required, but, when it is indicated, sodium pentothal is preferable for adults and older children. For infants, vinethane is safe and practicable, although chloroform in competent hands is equally effective.

Since the extent of any ocular injury remains unknown until examination is completed, all procedures should be conducted as gently as possible. Lid retractors of appropriate size are frequently useful. The general surgeon usually will not find it inconvenient to carry a pencil flashlight and a small loop of the Coddington type for focal illumination and magnification. This is an aid in locating corneal foreign bodies, since some foreign bodies, such as small iron-rust particles, are difficult to detect with the naked eye when they lie against an undilated brown iris. Conjunctival foreign particles, unless they are glass, usually are easily detectable.

The search for any foreign body should include examination not only of the cornea but of the conjunctival surfaces of the globe, as well as the lids and their margins. The latter may be the site of minute vesicles, especially in the presence of exacerbative blepharoconjunctivitis, or may harbor aberrant cilia as well as residual marginal chalazia and verrucous excrescences, all of which may simulate the presence of a foreign body. Also, the lumen of the upper and lower puncta occasionally may be obstructed to a lesser or greater degree by detached cilia, minute wood splinters, accretional plugs of leptothrix or streptothrix (more frequent in the upper canaliculus) or nits. The chronicity of symptoms sequential to these latter conditions readily differentiate them from the symptoms produced by agents more abruptly noxious to the external health of the eye and its adnexa.

The upper lid, no matter how difficult to grasp, invariably may be everted by directing the patient to maintain his gaze downward with both eyes open, while the examiner employs a blunt metal or glass spatula, or his own thumb or index finger, to press (gently) the skin of the upper eyelid from under the orbital margin in a backward and downward direction. The thumb and forefinger of the other hand grasp the margin of the upper lid while pulling it slightly forward in an upward direction. Replacement of the lid is readily effected by rapid elevation of gaze. Eversion of the lower lid is accomplished very simply by downward traction while the eyes are rotated upward. The procedures just mentioned permit inspection and examination of all external ocular surfaces except the upper fornix, which may be viewed in its entirety by the use of a lid retractor. This usually is necessary only when multiple foreign bodies are present, as occurs in blast injuries.

Removal of extraocular foreign particles of any type may often be accomplished with a tightly wound cotton swab which has been moistened in pontocaine, metaphen, zephiran, boric acid solution or some similar agent. A dry swab does not facilitate adhesion of the foreign body to the cotton, and it is also likely to cause greater epithelial damage. Many foreign particles, whether embedded or not, may be removed satisfactorily by lifting them away from the conjunctival or corneal epithelial surface with fine but bluntly pointed forceps especially designed for this purpose.

If this maneuver is not successful, a slightly blunted hypodermic needle, a cataract knife, a Bowman discission needle, or some similar substitute for the well known common eye spud may be employed. Hand-manipulated magnets are only infrequently useful. The conventional large, semiblunt spud, or the corneal burr, though capable of removing an extraocular foreign body, also may cause additional unnecessary tissue damage, especially if too enthusiastic an effort is made to rid the cornea of the coronal rust ring that may accompany a ferrous foreign body It will be recalled that even if corneal microsurgical intervention is accomplished with the aid of the biomicroscope (slit lamp), penetration of the membrane of Bowman, which lies underneath the epithelium, will result in permanent scarring and that if this occurs in the apical area of the cornea permanent impairment of vision will follow to some degree

Corneal epithelization is always hastened by the application of a snugly fitting pad over the closed eyelids It may even be necessary to apply a pressure bandage if the severity of the lesion justifies it If epithelial dehiscence is minimal and accompanied with little or no generalized ocular reaction, neither an eye pad nor paralyzation of accommodation may be necessary, however, it is usually wise to treat losses of corneal epithelium conservatively This may be done by the instillation of a solution of 5 per cent homatropine hydrobromide as the mildest agent, to atropine sulfate (1 to 3 per cent), or scopolamine hydrochloride to a concentration of 0 25 per cent Antiseptic ointments also may be instilled, alone or in combination with the cycloplegics just mentioned A slightly wet eye pad then should be applied Complications are usually avoidable if these simple procedures are followed Secondary medication after the pad is removed consists largely of a mildly astringent antiseptic collyrium for the following few days Redetermination of visual acuity and, if possible, examination of the ocular fundus should be accomplished when the patient is discharged

Burns — Immediate severe pain and subsequent marked loss of vision usually follow contact with any one of the numerous thermal and chemical agents capable of producing burns of the palpebral and bulbar conjunctiva and of the cornea Emergency treatment often is more efficacious the more rapidly it is instituted, and when acids, alkalies, and ammonia (the most common agents) are responsible, the instillation of castor oil preceded by copious irrigation with water or with saturated boric acid solution frequently affords satisfactory results Specific chemical neutralizing agents too often are not at hand for immediate use, in fact, the very heat generated by such agents often contraindicates their use

Lime, lye, and other caustic alkaline substances, such as ammonium, cause especially severe external ocular burns and require immediate and specific care to prevent or to minimize the dreaded complications of permanent corneal scarring and symblepharon Washing with copious amounts of water is imperative, as is the removal of all residual alkali particles with a petrolatum-impregnated applicator A buffer solution then should be instilled generously and frequently to *overcome the alkaline effect*

Rapid dilatation with a solution of 3 per cent atropine sulfate and/or with 10 per cent neosynephrine after instillation of 5 per cent pontocaine hydrochloride, and irrigation with neutral ammonium tartrate or 10 per cent lactate, should be done every two hours Ammonium, because of its volatility, tends to penetrate deeply and rapidly into the eye and may require evacuation of aqueous by paracentesis on several successive days

The instillation of sulfonamide ointment, or ointment containing an antibiotic, or a bland ointment is necessary before an eye pad or bandage is applied The eyes, however, must never be bandaged if a vesicant has been the offending agent

Hydrosulphosol concentrate in castor oil, to hasten tissue respiration, should be used in the form of drops when the eyes have undergone severe chemical burns (acid or alkali), however, for recent burns it may be used as a solution in distilled water every two to three hours for the first twenty-four hours This product also should be applied, as a spray solution or as an ointment, to the adjacent cutaneous areas T [illegible] tion of therapeutically active, water-soluble derivatives of chlorophyll "a" in an isotonic solution or as a hydrophilic base in ointment form is beneficial for all types of thermal and of irradiation injuries.

Sodium tetrathionate, an organic sulphur-containing solution, may be used cautiously as an intravenous adjunct for very severe burns. Rutin, given orally, may aid in reducing chemosis and local edema, but raw boiled milk given intragluteally for this purpose is more rapidly effective and also assists in combating local and systemic infection. Repeated visits are necessary to enable the examiner to prevent scarring and adhesions.

Local thermal burns, corneally or conjunctivally, frequently result in necrosis that invites infection, and the prevention of this must be the primary goal of the treatment instituted.

Actinic conjunctivitis (so-called snow blindness), acute drug sensitivities and physical allergies are best treated by administering no medication except zinc sulfanilate and epinephrine drops in combination with a saturated solution of boric acid, if indicated. Cracked ice compresses or the frequent brief application of an eye pad saturated with witch hazel may be soothing. These palliative measures also apply when mild burns of the globe or the skin of the eyelids have occurred after roentgen therapy or radium irradiation. These measures, however, do not apply to emergency care of structures of the inner eye; medical care of the latter is not feasible, although later surgical attention is frequently warranted, especially with regard to the removal of radiation cataract.

Lacerations.—Lacerations of the lids are among the more common ocular wounds. Early and adequate care of these will usually preclude later, more formidable plastic procedures except in those instances in which there are associated perforating injuries of the globe. The degree of severity of eyelid burns, of whatever cause, will determine the extent and nature of both local and systemic treatment. Since contamination of the burned or lacerated areas is almost invariably present or to be expected, it is most important to cleanse the wound, not with irritating antiseptic solutions, but with physiologic solution of sodium chloride after gentle washing with tincture of green soap and water. Wounds involving the deeper structures of the tarsus and orbicularis should be closed with interrupted No. 4 0 or 5 0 plain catgut sutures, and the skin by No. 6 0 black silk sutures on curved atraumatic needles. No sutures should be placed until the necessary débridement has been effected. Good lid function usually will ensue without cicatricial entropion or ectropion if closure layer by layer has been done. Extensive loss of tissue will necessitate plastic procedures, even including pedicle flaps, but the latter may eventually present numerous problems in those instances in which flash burns have been so extensive that the skin of the chest and arms also has undergone destruction. Appropriate pressure dressings are usually indicated. In general, however, the earlier adequate treatment is instituted, no matter how severe the injury, the more quickly will occur the return to as nearly normal a functional level as is possible.

Penetration and Perforation.—Penetration by a foreign body of one or more of the external tunics of the eye is a term that also is applicable with reference to the internal ocular structures but, if the foreign body succeeds, after ingress, in effecting egress, the resultant injury necessarily must be characterized as a perforating wound. The surgical distinctions involved are those of degree, although the through-and-through wound usually causes the greater trauma. Foreign particles that penetrate or perforate the globe, whether by first traversing the eyelid or by way of the globe directly, manifest a greater selectivity for the cornea because this structure presents the greatest amount of exposed tissue for receptivity of the entering agent.

Penetration may be confined to one or more of the external tunics of the eye; however, if only the conjunctiva suffers trauma from this type of wound, fine black silk on atraumatic needles will effect proper surgical repair Hospitalization usually is required if the sclera or the cornea undergoes penetration Uveal tissue, or vitreous, if prolapsed through the wound, must be cleanly removed with closely applied fine sharp scissors, curved on the flat, prior to suturing of the sclera

Small penetrating corneal wounds if there is no herniation of iris tissue or of lens or vitreous substance, especially if there is no manifest aqueous leakage may often be treated only by the instillation of atropine and the application of a snug eye pad, however, they may occasionally require closure by very fine black silk sutures and the use of special forceps to avoid corneal tissue crushing with subsequent scarring

Ragged and gaping corneal wounds usually require conjunctival apron flaps or sliding conjunctival ribbons, which must be secured by conjunctival sutures after adequate coverage of the cornea has been effected Any protruding intraocular prolapsed tissue, however, must be excised first Under no circumstances must any extruded intraocular tissue be replaced, no matter how desirable or sensible this may seem at the moment It usually is good practice, when repair of the cornea and iris is necessary, to inject a bubble of air into the anterior chamber to effect reformation of the chamber, as well as to prevent adhesions between the iris and the posterior corneal surface Free blood may be removed from the anterior chamber by gentle irrigation of the latter with warm physiologic solution of sodium chloride, although great care must be exercised to avoid injury to the lens Coagulated blood usually should not be disturbed, even with a fine forceps through a wide corneal incision, if it does not wash away readily

Since some corneal perforations result in penetration also of the crystalline lens with formation of a traumatic cataract, it may be necessary to consider lavage or so called linear extraction of the flocculent lens substance, however, when the amount of this now foreign material is small and obviously does not occupy much of the anterior chamber, it is advisable to leave well enough alone Absorption will usually occur but on occasion the flocculent particles may be so numerous and so swollen that lavage may become necessary to prevent the occurrence of painful secondary glaucoma

Complications —One or more of a number of intraocular lesions may occur as sequelae to contusing or penetrating injuries of the globe These are hemorrhage into the anterior chamber traumatic iritis, rupture iridodialysis, or paralysis of the iris and aniridia, dislocation (subluxation) of the lens commotio retinae disorganization of the vitreous or its detachment retinal detachment, and traumatic chorioretinitis Choroidal rupture may occur as a result of a contre coup injury Avulsion of the optic nerve may occur as a result of perforating injuries or of intraorbital trauma such as may follow bullet wounds, penetration by iron spikes or knitting needles, or ill advised or poorly performed operations on the maxillary sinus High voltage electricity, as in lightning shocks, may result in reduced visual acuity, but it is usually only secondary to slowly absorbed hemorrhages of the subarachnoid type induced by the current itself

Any or all of these manifestations of trauma may occur singly or in combination, and will require relatively prolonged treatment which permits the patient to be referred as soon as possible for specialty medical or surgical care, or both

Hemorrhage into the anterior chamber especially if so extensive as to obscure any least view of the iris or the fundus, and if there appears no indication of prompt absorption during the ensuing two days, may yield to irrigation or removal of the clots after paracentesis with a small keratome Failure to free the eye of this extravascular blood often results in secondary glaucoma or permanent blood staining of the cornea, or both Traumatic iritis, unless secondary glaucoma stubbornly intervenes, usually will yield to ophthalmomedical care alone. This treatment embraces atropinization, foreign protein therapy, the administration of salicylates and, for penetrating and perforating lesions, precautionary administration of an antitoxin after proper sensitivity precautions, as well as appropriate foreign protein therapy (typhoid-paratyphoid vaccine and raw boiled milk).

Subluxation of the lens, if minor, usually requires no treatment; but, if the lens becomes dislocated anteriorly, extraction with the lens loop is frequently necessary. If the lens is lost posteriorly and cannot be removed readily with the loop or by transfixion, the resulting uveitis and/or secondary glaucoma may necessitate enucleation—not only for the relief of pain but to prevent the occurrence of sympathetic disease in the fellow eye. Retinal detachment, statistically, regardless of its traumatic causation, is most likely to occur in myopic and elderly persons, especially those who have cystic disease of the retina. Thus, seemingly trivial ocular injuries in persons of this type should be observed at more frequent intervals post-traumatically than is necessary for younger, healthier persons with previously normal eyes. In the main, cure of separation or detachment of the retina is more apt to be effected the earlier one resorts to surgical intervention.

Massive hemorrhage into the vitreous is best treated by advising normal physical activity, the maintenance of the best possible health, and the immediate administration of rutin to tolerance, or to 1,000 mg. daily. Vitreous detachments are not amenable to treatment; however, their presence may presage the occurrence of retinal detachment at some future time. Choroidal ruptures do not lend themselves to surgical repair.

Deformation of the pupil, whether due to permanent dilatation because of rupture of the iris sphincter or detachment at its root, both of which conditions may follow severe contusion of the eye, usually requires no treatment other than acceptance of the situation on the part of the patient; however, very severe degrees of iridodialysis may require surgical conversion into one pupillary opening by means of iridectomy if monocular diplopia is excessively annoying.

Sympathetic ophthalmia, an inflammatory disease occurring in an uninjured fellow eye, although currently rather infrequent, is believed to be altogether preventable if the injured eye, hopelessly damaged and blind, can be removed at once. This procedure is recommended because ultimate sympathetic disease may not supervene for weeks, months, or even years (it is believed never to occur earlier than the tenth day after injury). This interval, however, permits a careful study and decision concerning the necessity for enucleation.

The relentless course of sympathetic ophthalmia, which runs the gamut of inflammatory signs and symptoms and through secondary glaucoma, complicated cataract and ultimately pthisis bulbi, should stimulate the surgeon to insist upon removal of the injured eye, especially the hopelessly injured eye and particularly when the penetrating injury has occurred in the region of the ciliary body. This area extends circumferentially for a distance of 8 mm. around the cornea. In general, it occurs within the first month after injury, is most frequent in children and is fairly uncommon after three or more months have passed. Its cause is obscure, although allergy of the uveal tract is often held responsible. Treatment serves more to delay the ultimate hopeless result than to restore visual capacity to normal, and, as is true of the many predicated etiologic factors, the variety of treatments proposed attests to their essential inefficacy.

Perforating, or through-and-through ocular injuries, are very rare in that, except for those occasioned by gunshot and war wounds, the offending foreign body must be of such peculiarly high velocity, small size and high temperature that only the bony wall of the posterior orbit stops its further progress after it has traversed the globe. Most perforating wounds of the eyeball, if they do not immediately cause destruction and loss of function, usually result in no more serious an injury than a traumatic cataract, which may be treated surgically at a selected date in the future

The majority of penetrating ocular wounds are caused by small metallic objects that enter the eye with great force These are most frequently magnetic and almost invariably lend themselves to removal, either posterior or anterior to the iris, by early and expert use of the giant magnet In the absence of a Berman localizer, they may be located by roentgenographic study and three-dimensional *charting of the foreign body on an appropriate chart*, which then indicates the *surgical approach*

Stainless steel, it should be mentioned, is not magnetic unless it has been machined or milled or has been roughly handled by chipping or pounding Intraocular retention of steel or of iron foreign bodies, by *oxidation, causes siderosis* with ultimate pthisis after a period of many years during which depigmentation with superimposition of a greenish hue of the tissues has occurred Copper fragments produce chalcosis, which also results in pthisis bulbi and which usually necessitates eventual enucleation Lead and glass are much better tolerated, and plexiglass and other clear plastic fragments are frequently well tolerated, with retention of essentially useful vision, although the particles may remain fully visible within the eye Some foreign bodies, such as wood, may not be visualizable roentgenographically or even ophthalmoscopically, but a soft tissue technic employing dental plates may render them roentgenographically visible, thus facilitating their surgical removal

Rapid and efficient sterilization of ocular instruments, especially those to be employed in entering the globe itself, may be effected according to the method of Post Only thirty seconds of immersion for clean instruments and four and a half minutes for "dirty" instruments are required if the following solution is employed for the sterilizing process

Liquor cresolis compound	8 cc
Oil of lavender	2 cc
Thymol crystals	2 Gm
Ethyl alcohol 95 per cent	88 cc

The general surgeon not infrequently encounters ocular medical problems arising from, or associated with, the rapid or sudden loss of sight in one or both eyes The symptoms of loss of sight, although somewhat similar from instance to instance, derive from a great variety of diverse causes This diversification, however, is more a matter of degree than of kind Detachment of the retina, for example, may have been present for varying periods prior to its relatively rapid appreciation by the patient Conversely, it may unequivocally be causally related to a *specific incident* of *lesser or greater* trauma

Rapid and sudden darkening of the entire field of vision (usually unilateral) is most often sequential to massive vitreous hemorrhage This hemorrhage, in the *absence of trauma, most frequently follows* advanced diabetic retinopathy or atherosclerosis, or both It may be accompanied by some degree of reddishness of imagery

The onset of rapid or sudden elevations of intraocular fluid pressure is always accompanied by marked discomfort and diminution in vision but usually concomitant with acute ocular pain and marked loss of visual acuity The pain may be only local, but not infrequently it is referred elsewhere—so peripherally that it may even simulate the pain of an acutely diseased appendix Such glaucomatous episodes are classifiable as hemorrhagic and/or congestive and may represent an isolated occurrence or the exacerbation of a preexisting glaucomatous state Since the anterior chamber usually is extremely shallow or even absent, im*mediate surgical relief* is best afforded by sclerotomy or sclerectomy of the inferotemporal quadrant of the involved globe, after which, in a few hours or a few days, an appropriate anterior segment operation may be performed with far less risk than if it had been done as the original surgical procedure However, medical treatment for acute glaucoma frequently is much more satisfactory than surgical intervention, especially if instituted within and up to the first twelve hours after onset of the acute episode. Among these measures are the intravenous administration of 25 to 50 cc. of 50 per cent dextrose solution, to which may be added 5 cc. of physiologic solution of sodium chloride; or a single intravenous injection of sorbitol up to 25 cc.; retrobulbar injections of solutions of procaine and epinephrine; crushed ice compresses; and the frequent instillation of 5 per cent to 10 per cent pilocarpine nitrate (as often as every five minutes) ; but never, particularly if the anterior chamber is very shallow, any instillation of eserine salicylate in any concentration. In general, operation should not be delayed beyond twelve hours if there has been minimal response or no response to medical measures.

Obstruction with complete closure of the central artery of the retina usually brings about total blindness, since deprivation to the retina of the arterial blood flow cannot exist for more than five minutes without death of the sensory elements. Central venous obstruction also usually abolishes useful vision. Tributary branch closures of retinal arterioles or of retinal veins usually eventuate in destruction of visual usefulness in the distribution or drainage sectors involved. Current therapy offers some questionable benefit. Dicumerol, vitamin K or rutin is administered quickly in high doses for relatively short periods as indicated.

The optic neuritides, whether retobulbar or located within the scleral foramen, are most frequently regarded as deficiency diseases in which high proteinization and intensive vitaminization constitute the indicated therapy. Binocular loss of vision occurs in approximately 10 per cent of cases; however, retinal edema in the acute hypertensive phase of chronic glomerulonephritis, as well as in the hypertensive toxemia of pregnancy or as the result of retrobulbar neuritis in hyperemesis gravidarum, constitutes a dramatic episode, the history of which will indicate its cause and will lead to proper diagnosis and thus direct the course of appropriate, immediate therapy.

Diabetes mellitus is the only metabolic disease that will produce such rapid alterations in visual acuity that, to the patient, they will seem sudden and ominous. These changes are due to the acute myopia that occasionally occurs in diabetic patients owing to the myopia that they experience after a rapid loss of fluid from the intraocular crystalline lens. In rare instances visual acuity, more qualitative than quantitative and more peripheral than central, may occur premenstrually, as well as in the first two days of menstruation proper. This symptom occasionally is pathognomonic of a chromaphobe adenoma of the pituitary gland and requires detailed special diagnostic study.

Inflammatory intraocular diseases are frequently obscure in their origin and usually do not result in rapid deterioration of vision. However, diminution of sight in a previously normally seeing eye will occur sufficiently often in the presence of focal sepsis, syphilis, tuberculosis, Boeck's sarcoidosis, arthritis and the exanthemas that the general surgeon and practitioner should be cognizant of these possibilities.

Hypertensive and atherosclerotic diseases manifest themselves by retinopathic conditions in the eyegrounds, as does preeclamptic hypertensive toxemia, diabetes and certain blood dyscrasias, but only as a manifestation in some degree of the advanced abnormal physiologic picture. The observable alterations not only are essentially organically irreversible but, in their very development, effect depressions in degree of visual acuity. This dysfunction usually is insidious and not rapid, although the patient, particularly if he has one eye, may suddenly become aware of some degree of malfunction of this special sense organ and thus bring to the practitioner a problem that, in its immediacy, appears to be one of urgency. In the main, however, the treatment of local and systemic medical diseases [illegible] vision does not lie within the province of the general surgeon, since these diseases do not constitute ocular surgical emergencies as such

SUMMARY

The author discusses various injuries and diseases of the eye from the point of view of the general surgeon who may be called upon to act in the absence of an ophthalmologist These conditions include foreign bodies, burns, penetration, perforation, laceration, hemorrhage, retinal detachment and various other entities Practical suggestions for therapy are presented

RESUMEN

El autor discute diversas lesiones y enfermedades del ojo desde el punto de vista del cirujano general, quien puede ser llamado para actuar en ausencia de un oftalmologo Estos estados incluyen cuerpos extraños, quemaduras, penetracion, perforacion, laceracion, hemorragia, desprendimiento de la retina y otras diversas entidades Se presentan sugestiones practicas para la terapeutica

ZUSAMMENFASSUNG

Der Verfasser eroertert verschiedene Verletzungen und Erkrankungen des Auges vom Standpunkt des Allgemeinchirurgen, dessen Tilfe, wenn kein Augenarzt zur Hand ist, in Anspruch genommen werden mag Zu diesen Erkrankungen gehoeren Fremdkoerper, Verbrennungen, Perforationen, Risse, Blutungen, Netzhautabloesung und verschiedene andere Zustaende Es werden praktische Vorschlaege zur Behandlung vorgelegt

RIASSUNTO

L'A discute differenti ingiurie e malstrie del occhio dal punto di vista del chirurgo generale chi e' convocato ad operare nell'assenza d'un olftalmologista Queste condizioni inchiudono corpi stranieri ustioni, penetrazione, perforamento, lacerazione, emorragia, distaccamento retinale ed altre entita Presenta suggestioni pratiche per terpia

SUMARIO

O autor discute varios traumatismos e doenças dos olhos sob os pontos de vista do cirurgiao geral que pode ser eventualmente obrigado a agir na falta de um oftalmologista Estas condições incluem corpos extranhos, queimaduras, penetraçao, perfuração, laceração, hemorragia, descolamento de retina e varias outras entidades Sugestões praticas de terapêutica são apresentadas

RESUME

L'auteur passe en revue les differents traumatismes et les lesions variees de l'oeil qu'un chirurgien general droit traiter, vu l'absence d'un ophtalmologiste On rencontre alors les corps etrangers, les brûlures, la penetration, la perforation, les lacerations, l'hemorragie, les *decollements de la retine et autres.* On donne ici les conseils pratiques pour le traitement de ces lesions

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Foreign Bodies in Hepatic Ducts

Review of the Literature

MAX THOREK, M.D., F.I.C.S.
CHICAGO

THE occurrence of foreign bodies in the hepatic ducts, and especially in the common bile duct, is relatively rare, though Baumgartner and Lasky[1] have recently suggested that many such bodies remain undetected owing to the fact that they are capable of acting as nuclei for concretions and may therfore exist in the cores of isolated calculi. Whether or not the generally accepted rate of incidence is influenced by this factor, the subject in general is of peculiar interest to the surgeon. As recorded in the literature, such foreign bodies include sections of gauze, cotton threads, fragments of rubber tubing, needles, bristles, various suture materials, and fragments of wire or other metal, including hemostat blades, bullets and—at least in one recorded instance—the handle of a spoon! Small fruit pits are also observed occasionally.

Generally speaking, these objects gain admission to the body in three ways: (*1*) by indigestion, (*2*) by surgical accident or oversight, and (*3*) by access to a nonsurgical wound. Their migration into the ducts is not completely understood. It remains, therefore, a matter of speculation; for, although logical and fairly convincing explanations have been offered in particular cases, there are other cases in which no explanation whatever can be found.

REVIEW OF LITERATURE

In 1926, Oppel[2] reported a case in which a surgical swab overlooked and left in a cholecystectomy wound migrated into the common duct, where it was discovered four months later. The patient had died of peritonitis. In the following year (1927) Lemierre and Pollet[3] added the case of an insane woman aged 50 who swallowed a spoon handle 13.5 cm. in length. The patient complained of a "stitch" in the lower part of the thorax and had a persistent, dry, unproductive cough. She was severely emaciated. An abscess of the liver was suspected, and surgical intervention was undertaken. Exploration revealed that the spoon handle, by this time considerably oxidized, had found its way into the common bile duct, extending thence to the liver. The patient died.

Three years later, in 1930, Fedoroff[4] reported the case of a patient operated on for the removal of gallstones. A T-tube was used for drainage, and on its removal (seventeen days after the operation) the horizontal bar broke off and remained buried in the wound. In spite of this fact the patient remained asymptomatic for two and one-half years. Attacks of colic and jaundice then occurred, abating and recurring sporadically over another two-year period. A second operation was performed. The tube was found, completely unaltered except for a coating of bilesand, in the retroduodenal portion of the common bile duct. The patient recovered.
year by Goldman[5], whose patient, a man aged 36, had suffered a bullet wound four-

Another case was reported in the same teen years prior to the onset of the symptoms calling for investigation. Severe pain of unexplained origin, persisting for about a year, resulted in a decision to operate. A copper bullet covered with a gritty brownish precipitate was found in the cystic duct. In this case also the patient made a recovery.

Eichelter[6], in 1931, discovered cotton fibers in the common duct of a patient aged 39, apparently from a drain inserted during an operation performed fifteen

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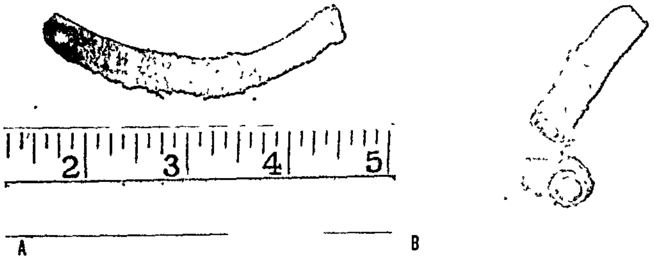

A, drainage tube removed from common duct after twenty-five years.
B, drainage tube in cross section.

months before. During the first part of this period no symtoms were observed, but eventually the patient showed signs of jaundice, with accompanying pain in the right upper abdominal quadrant. Two months after the onset of these symptoms a second operation was performed. The fibers, when found, were heavily encrusted. The patient recovered.

In 1932, Cooke[7] reported the case of a man aged 65, admitted to the hospital for indigestion, vomiting and pain under the right costal margin. Palpation revealed a swelling below the liver. Cholecystectomy was performed, and an L-shaped piece of wire was removed from the common duct, where it projected through the wall just below the end of the cystic duct. The patient, on recovery, was unable to explain the presence of the wire. He had undergone no previous operations. It is therefore probable that the wire was ingested.

Toland[8], in 1933, reviewed the literature and reported the case of a man aged 49, anemic and jaundiced, in whose common duct there was a lump of cotton gauze measuring approximately 1 by 1 cm. and heavily impregnated with bile salts and fibrin. Its presence dated from an operation performed four months earlier. The patient died.

In a case reported by Crawford and Stewart[9] in 1939, a woman aged 33 was admitted to the hospital for recurrent jaundice of seven years' duration, following cholecystectomy and appendectomy. The condition was painless, although the stools were clay-colored and some hemorrhage was noted. Surgical exploration revealed a hemostat blade 4.2 cm. long in the hepatic duct, coated with "dark green friable pigment concretions." The patient died. Neither operation nor autopsy revealed the manner in which the hemostat blade had migrated into the duct.

In 1940, Baumgartner and Lasky[1] described the case of a Negro youth aged 20, admitted to the hospital for nausea, vomiting and sharp pain in the right upper quadrant of the abdomen. Laparotomy revealed large amounts of stony material and a foreign body with a bulbous tip, which proved on examination to be a cherry stem, partly decomposed, The patient recovered. On being questioned, he agreed that the stem had probably been swallowed years before.

Bowen[10], in 1941, reported the case of a woman aged 42 who suffered from jaundice and biliary colic. Five years earlier she had been operated on for appendicitis and had made an apparently good recovery. The symptoms leading to her second hospitalization had been present for about a year. A 2-inch fragment of a No. 20F catheter, filled and covered with greenish calcareous deposits, was found in the common duct. It was removed, and the [illegible] made an uneventful recovery.

The [illegible] is [illegible]

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CHICAGO

THE occurrence of foreign bodies in the hepatic ducts, and especially in the common bile duct, is relatively rare, though Baumgartner and Lasky[1] have recently suggested that many such bodies remain undetected owing to the fact that they are capable of acting as nuclei for concretions and may therfore exist in the cores of isolated calculi. Whether or not the generally accepted rate of incidence is influenced by this factor, the subject in general is of peculiar interest to the surgeon. As recorded in the literature, such foreign bodies include sections of gauze, cotton threads, fragments of rubber tubing, needles, bristles, various suture materials, and fragments of wire or other metal, including hemostat blades, bullets and—at least in one recorded instance—the handle of a spoon! Small fruit pits are also observed occasionally.

Generally speaking, these objects gain admission to the body in three ways: (*1*) by indigestion, (*2*) by surgical accident or oversight, and (*3*) by access to a nonsurgical wound. Their migration into the ducts is not completely understood. It remains, therefore, a matter of speculation; for, although logical and fairly convincing explanations have been offered in particular cases, there are other cases in which no explanation whatever can be found.

REVIEW OF LITERATURE

In 1926, Oppel[2] reported a case in which a surgical swab overlooked and left in a cholecystectomy wound migrated into the common duct, where it was discovered four months later. The patient had died of peritonitis. In the following year (1927) Lemierre and Pollet[3] added the case of an insane woman aged 50 who swallowed a spoon handle 13.5 cm. in length. The patient complained of a "stitch" in the lower part of the thorax and had a persistent, dry, unproductive cough. She was severely emaciated. An abscess of the liver was suspected, and surgical intervention was undertaken. Exploration revealed that the spoon handle, by this time considerably oxidized, had found its way into the common bile duct, extending thence to the liver. The patient died.

Three years later, in 1930, Fedoroff[4] reported the case of a patient operated on for the removal of gallstones. A T-tube was used for drainage, and on its removal (seventeen days after the operation) the horizontal bar broke off and remained buried in the wound. In spite of this fact the patient remained asymptomatic for two and one-half years. Attacks of colic and jaundice then occurred, abating and recurring sporadically over another two-year period. A second operation was performed. The tube was found, completely unaltered except for a coating of bilesand, in the retroduodenal portion of the common bile duct. The patient recovered.
year by Goldman[5], whose patient, a man aged 36, had suffered a bullet wound four-

Another case was reported in the same teen years prior to the onset of the symptoms calling for investigation. Severe pain of unexplained origin, persisting for about a year, resulted in a decision to operate. A copper bullet covered with a gritty brownish precipitate was found in the cystic duct. In this case also the patient made a recovery.

Eichelter[6], in 1931, discovered cotton fibers in the common duct of a patient aged 39, apparently from a drain inserted during an operation performed fifteen

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SUMMARY

The occurrence of foreign bodies in the hepatic ducts, especially in the common bile duct, is examined from the etiopathologic point of view, and the literature is reviewed, with emphasis on the considerable variation of symptoms, sequelae and operative results A case of the author's own, in which a foreign body was discovered in the common bile duct after twenty-five years, is reported in detail

ZUSAMMENFASSUNG

Das Vorkommen von Fremdkoerpern in den Gallengaengen besonders im Ductus choledochus wird vom aetiologischpathologischen Standpunkt aus untersucht Es wird ein Ueberblick ueber die Literatur gegeben und besonders die betraechtliche Wechselhaftigkeit der Symptome, der Folgezustaende und der chirurgischen Ergebnisse hervorgehoben Ein eigener Fall des Verfassers, in dem ein Fremdkoerper im Choledochus nach fuenfundzwanzig Jahren entdeckt wurde, wird im einzelnen berichtet

RESUMEN

Se examina etiopatologicamente la ocurrencia de cuerpos extraños en las vias hepaticas, especialmente en el coledoco Se revisa la literatura señalando la considerable variacion de sintomas, secuelas y resultados operatorios Se da a conocer circunstanciadamente un caso del autor en que, despues de veinticinco años, se descubrio un cuerpo extraño en el coledoco

RIASSUNTO

Esamina dal punto di vista ezio-patalogico l'occorrenza di corpi estranei nei dotti epatici, specialmente nel coledoco, e passa in rassegna la letteratura, con enfasi sulla variazione importante dei sintomi, sequele e risultati operativi Un caso del'A in cui scopri un corpo estraneo nel coledoco dopo venticinque anni viene riportato in dettaglio

SUMARIO

A ocorrencia de corpos extranhos nos canais hepaticos, especialmente no coledoco, e examinada sob o ponto de vista etiologico e a literatura e revista, com realce da consideravel variação de sintomas, sequelas e resultados operatorios Descreve-se com detalhes um caso proprio do autor, no qual um corpo extranho foi descoberto no coledoco depois de vinte e cinco anos

RESUME

L'auteur etudie la frequence des corps etrangers dans les canaux hepatiques, particulierement dans le choledoque, et leur etiologie, il passe aussi en revue toute la litterature sur ce sujet, en appuyant surtout sur la variete des signes cliniques, les sequelles et les resultats post-operatoires

L'auteur decrit en detail un cas personnel qui presentait un corps etranger du choledoque depuis 25 ans

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chiefly for the prolonged period during which the foreign body, a segment of rubber tubing, remained in the common bile duct.

REPORT OF CASE

Mrs. H. N., a Negress 68 years of age, was admitted to the hospital on March 23, 1949. She complained of discomfort in the epigastrium, disturbed digestion and constipation. A cholecystectomy had been performed about twenty-five years before.

Physical examination revealed that she was not acutely ill, but fully conscious, cooperative and mentally alert. There was marked epigastric tenderness, pronounced all over the gallbladder region, with a mass extending from 2 inches (5 cm.) above the umbilicus in the right upper quadrant to about the costal region; this mass was rather tender and uneven—almost nodular. The abdomen was soft but tympanitic.

The clinical impression was that of a malignant growth in the gallbladder or carcinoma of the stomach or pancreas.

The roentgen results follow: 1. The gallbladder could not be visualized radiologically, owing to cholecystectomy, obstruction of the cystic duct or chronic cholecystitis. 2. The gastrointestinal picture suggested an extrinsic pressure effect on the lesser curvature of the stomach. There was no evidence of intrinsic abnormality of the stomach or duodenum, but diverticula appeared in the descending colon and splenic flexure. 3. A barium enema showed diverticulosis of the hepatic flexure and descending colon and possible local irritation.

On April 4 the abdomen was explored. The stomach was found to be distorted by traction of adhesion to the gallbladder area and by pressure of an enlarged liver. The gallbladder was present. The hepatic, cystic and common bile ducts were markedly distended; the former two and the gallbladder appeared to be filled with "mud" and gravel; the common and hepatic ducts seemed to harbor stones.

When the common duct was opened, it was found to contain an old piece of rubber tubing about 3 inches long, "mud," and gravel. The tube was removed. A T-tube was placed in the common duct.

The patient's postoperative course was uneventful. A cholangiogram taken on April 19 revealed marked dilatation of the common bile duct but no evidence of obstruction of the biliary tract. The T-tube was removed on the twelfth postoperative day. The patient appeared in good condition on May 1.

COMMENT

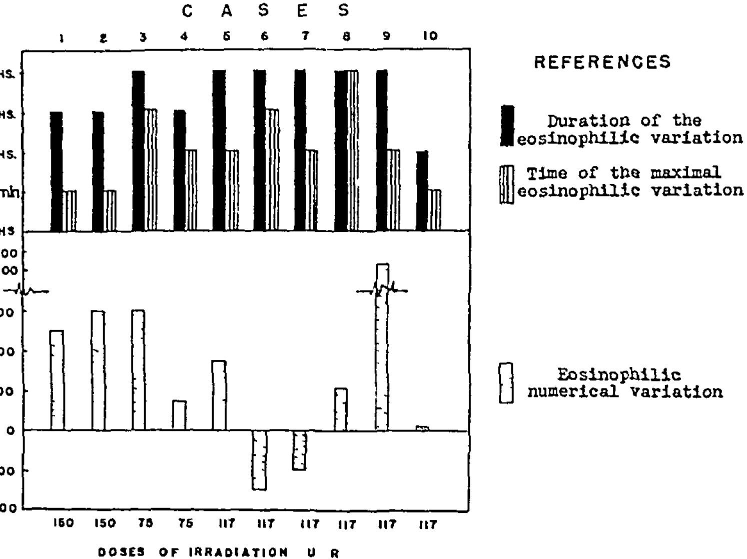
Further interest, as well as considerable difficulty, is added to the study of this unpredictable condition by the fact that the clinical picture is far from clear. Symptoms that may indicate the presence of a foreign body or bodies in the hepatic ducts include abdominal pain (chiefly in the upper quadrants), nausea, vomiting, jaundice, emaciation and tumescence. Complications may result on a traumatic, an infective or a mechanical (obstructive) basis. It will be remembered that in the case reported by Lemierre and Pollet[3] there was a hepatic abscess, and that Oppel's patient died of peritonitis[2]. In the case described by Crawford and Stewart[9] there was hepatic insufficiency due to obstruction, with jaundice of seven years' duration and an internal biliary fistula.

Preoperatively the symptoms observed are characteristic of so many other pathologic conditions that it is difficult to arrive at a certainty as to the condition actually present. The occurrence of these symptoms, especially if several of them appear in combination, should suggest the advisability of thorough roentgen examination and, if necessary, exploratory laparotomy. Crawford and Stewart were able to make a preoperative diagnosis of foreign body on roentgen examination alone, but this is not always possible. In this connection, Bowen[10] expressed a firm objection to the use of rubber tubing in reconstruction of the biliary passages, on the ground that it is likely to be blocked by the deposition of bile salts. He recommended that new and well made tubing be invariably employed in such operations, and that it be tubing of a type that is visible in the roentgenogram.

Method Used in Irradiation Studies

Group	Case Nos	Kilovolts	Milliamperes	Distance Cm	Filtration	Time Minutes	Dose, Roentgens
A	1 and 2	180	5	50	0.5 mm Cu 1 mm Al	5	150
B	3 and 4	180	5	25	0.5 mm Cu 1 mm Al	5	75
C	5 6 7 and 8	130	10	50	3 mm Al	5	117
D	9 and 10	150	10	50	3 mm Al	3	117

adrenal oxycorticosteroids, which in turn produce eosinopenia, the spleen does not take part in the eosinophilic depression induced by epinephrine (Dury[14]) Vogt observed that with the infusion of epinephrine the adrenal cortex increases the amount of secretion,[15] the same effect produced by splanchnic stimulation[16] In 1947 Long reported that epinephrine produces an increase in utilization of the cortical hormones by the tissues, or changes the hematic composition, increasing the amount of corticotropic secretion[1] Epinephrine also produces a decrease in ascorbic acid and cholesterol[18] Finally, Almy and Laragh,[19] Godlowski[20] and Hortling and Pekkarinen[1] reported that in man the administration of epinephrine



Eosinophilic Variations After Irradiation of the Adrenal Glands

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BEFORE 1948 there was no direct experimental means to test the influence of the hypophysis and the adrenal cortex upon the number of circulating eosinophils. In 1939 Dalton and Selye observed a decrease in the number of eosinophils in the rat, produced by certain "alarm" stimuli.[1] Some time later Selye included this phenomenon in his general adaptation theory.[2] It was not until 1948 that Hills, Forsham and Finch demonstrated that ACTH and compound F of Wintersteiner produce a decrease in the number of eosinophils[3]; this has been corroborated by other investigators, Herbert and De Vries, Elkinton, Hunt, Godfrey, McCrory, Rogerson and Stokes.[4] In 1948 Forsham, Thorn, Prunty and Hills added a report of decrease in the number of eosinophils after the administration of ACTH as a test to determine adrenal function.[5]

Knowing that after irradiation of the adrenal glands there is a variation in the number of lymphocytes in man, variation in which may be due to modification processes in the quantity of glandular secretion,[6] we have recorded the number of circulating eosinophils after irradiation with the purpose of obtaining a test of the presence and function of each adrenal gland separately, as the test performed by Forsham, Thorn, Prunty and Hills gives a result which includes the function of both adrenal glands. The possibility of determining the functional state of each gland separately is of great clinical and surgical importance.

Previous Work.—Little is known about the function of the eosinophils and the mechanisms by which variations in their number are produced. In 1950 Hench came to the conclusion that, though much has been done in the field of research, little is known about the mechanisms by which these hormones act.[7] Nevertheless, it has been observed clinically that there is a relation of both elements, eosinophils and corticotropic, hypophysial and corticoadrenal hormones: in Cushing's syndrome, in which the ketosteroids are as a rule increased (Venning[8]) there is eosinopenia (Levine and Weisberg[9]); in adrenal insufficiency, in which the ketosteroids are diminished (Venning[8]) there is eosinophilia (Lewis[10]; Thorn and Forsham[11]). Nevertheless, such a relation in the variation of the number of eosinophils is not absolute, since the ketosteroids represent the products of degradation of the androgenic adrenal hormones and those of testosterone (Wilhelm[12]). In the adrenogenital syndrome, in which the ketosteroids are greatly increased (Venning, 1950[8]) there is no eosinopenia (Thorn and Forsham[11]). One must bear in mind also that such clinical relations of hyperfunction of the adrenal cortex-eosinopenia and hypofunction-eosinophilia are proved in the experimental test of clinical importance developed by Forsham, Thorn, Prunty and Hills, who were able to obtain evidence of such a relation.[5]

With respect to the relation of eosinophils and epinephrine or adrenal medulla, Speirs and Meyer[13] observed that this substance produces eosinophilia in adrenalectomized animals and eosinopenia in normal and hypophysectomized animals. This has been attributed to the fact that epinephrine determines increase in the

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the experimental one reported by Speirs and Meyer.

Consequently we believe, on the basis of previous data, that the increase in the number of eosinophils produced in man after adrenal irradiation is due mainly to an inhibition of corticoadrenal secretion, though it is not possible to discard the role played by inhibition of medullary secretion.

As for the decrease in the number of eosinophils, it may be due to: (1) stimulation of the adrenal cortex or (2) increased epinephrine secretion, which in turn would increase cortical secretion. We are inclined to believe that both mechanisms participate, as per data obtained with other biological reagents.

The fact that neither type of variation, increase or decrease, showed a relation to the character and intensity of the stimulus, and that both were obsered in one subject for whom a stimulus having the same characteristics was used, indicates that *the eosinophilic variations* produced after roentgen irradiation of the adrenal glands are in *relation* with the state of each of the glands.

CONCLUSIONS

1. The adrenal glands determine, in man, variations in the number of eosinophils after being stimulated by roentgen rays.

2. Such a variation consists mainly in an *increase* in the number of eosinophils. This is attributed, by experimental and clinical analogy, to cortical inhibition.

3. There is also a *decrease* in the number of eosinophils, though this response is in much less proportion than the former, which may be attributed to stimulation of the cortex and medulla.

4. There does not seem to be a relation between the characteristics of the stimulus and the type of response obtained, at least with the type of stimulus we used in our experiments.

5. The adrenal glands in the same subject may elicit different responses when the same stimulus is used with roentgen rays.

6. Determination of the eosinophilic variations, lymphocytic variations and modifications in the hematic cells and blood chemistry after irradiation may be of great help in establishing the existence and function of the adrenal glands in certain conditions of clinical and surgical importance, and also in verifying an indication for irradiation in certain diseases of the adrenal glands—especially when total monolateral adrenalectomy is indicated, not so much to disclose the congenital absence of the contralateral gland as to disclose possible insufficiencies, since the indication for adrenalectomy must presuppose the presence and sufficiency of the contralateral gland.[24]

SUMMARY

A study is made of the variations in the number of eosinophils produced after roentgen irradiation of the adrenal glands, with special reference to one of the several aspects in *the field of investigation*, in an effort to identify certain phenomena related to the presence and functions of the adrenals. A *method* is presented which may prove to be a valuable aid in certain conditions of clinical and surgical importance.

RESUMEN

Se estudian las variaciones eosinófilas por irradiación suprarrenal con rayon röntgen, en uno de los aspectos de investigación sobre el particular, con fines a la identificación de fenómenos relacionados con la presencia y función suprarrenal, de posible utilidad en determinadas condiciones de importancia clínica y quirúrgica.

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produced eosinopenia. This is determined partly by the action exerted upon the adrenal cortex, increasing its secretion directly or through the hypophysis.[22] It may be concluded, then, that the increase in the amount of epinephrine produces eosinopenia through hypophysial and adrenal activities.

EXPERIMENTAL METHOD

Ten observations were made after adrenal irradiation in 5 normal adults. The number of circulating eosinophils per cubic millimeter of blood was recorded before irradiation and fifteen minutes, three hours, twelve hours and twenty-four hours after irradiation. The dosage and characteristics of the irradiation were determined by Dr. Manuel F. Madrazo in accordance with the various experiments and successive observations. The groups were treated as shown in the accompanying table.

RESULTS

In the 10 cases of our experiment a variation in the number of circulating eosinophils was observed; in 8 of them an increase occurred, and in 2 there was a decrease. The point of maximal intensity in variation was the one corresponding to three hours after irradiation in 4 cases, in the one corresponding to fifteen minutes in 3 cases, in that of twelve hours in 2 cases, in that of twenty-four hours in the remaining case. As for the numerical variation, the increase in the number of circulating eosinophils was 12 minimum and 1,173 maximum in relation to the number recorded before irradiation (initial reading). The decrease in the number of eosinophils was 156 in one case and 96 in the other.

Neither the increase nor the decrease in the number of circulating eosinophils showed a relation in its character or intensity to the variations in the stimulus; in 2 cases, with the same stimulus, there was an increase in the number of eosinophils in one of the adrenal glands and a decrease in the contralateral gland (Cases 5 and 6 and Cases 7 and 8).

COMMENT

From our observations it may be concluded that the most striking variation, owing to its frequency, is the increase in the number of eosinophils; with the exception of Case 10, in which there was only a slight variation, it can be deduced that irradiation was responsible for the variation in the number of eosinophils. However, it is not possible to say which of the two components of the adrenal gland (cortex or medulla) is responsible for the type of response observed, since both are irradiated.

The increase in the number of eosinophils after adrenal irradiation may be due to: (1) inhibition of corticoadrenal secretion, since the states in which there is a decrease in the amount of secretion are accompanied by eosinophilia; (2) inhibition of medullary secretion with normal adrenocortical secretion, as in man under basal conditions the secretion of epinephrine seems to be continual,* or (3) stimulation of the adrenal medulla, with a deficient corticoadrenal function as reported by Speirs and Meyer,[13] who noted that epinephrine produces eosinophilia in the absence of adrenal cortex.

The first two factors are correlated. Nevertheless, we conclude that, as epinephrine is only one of the several substances that stimulate cortical secretion, this factor in itself would not explain the intensity of the eosinophilia recorded. We believe it more important to consider that the increase in the number of eosinophils is due to inhibition of corticoadrenal secretion. We have overestimated medullary stimulation in the past (Manzanilla and Manzanilla, 1950[6]); our present experiments indicate that it does not have such an importance, since clinically it has not been possible to obtain, among the adrenal insufficiencies observed, a case similar to the experimental one reported by Speirs and Meyer

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*This is based on our former observations[23] after adrenal denervation, glycemia being used as a biological reactor, stressing the fact that epinephrine stimulates corticoadrenal secretion in several ways.

Consequently we believe, on the basis of previous data, that the *increase in the* number of eosinophils produced in man after adrenal irradiation is due mainly to an inhibition of corticoadrenal secretion, *though it is not possible to discard the* role played by *inhibition of medullary* secretion

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Berylliosis and Silicosis

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SINCE World War II, the hazard of *beryllium poisoning has become well* known in industry. Prior to that time there were sporadic cases cited in the European literature. Gelman[1] and others reported a number of cases of beryllium poisoning in workers from beryl ore mines in the Ural Mountains. In his report to the League of Nations, he described all the phases and variants of the disease as it is now known in the United States. Even the neighborhood cases were correctly described by him. If there were any cases in the United States prior to World War II, they were not recognized. One such case, observed in New Jersey, was cited by Martland[2] in his paper on "Occupational Beryllium Poisoning in New Jersey".** In that report, Martland included a case brought to him as Chief Medical Examiner of Essex County by R. Pomeranz.[3] That case had been reported by Pomeranz as "nickel poisoning and productive miliary tuberculosis". Further studies by Gardner and Martland and the history of exposure to beryllium finally established this as a case of berylliosis. It was the first reported case of beryllium poisoning in New Jersey before World War II. Additional patients with berylliosis contracted before World War II and treated for many years with the diagnosis of chronic tuberculosis came to autopsy last year and will be reported later.

Because of the excellent metallurgic properties of beryllium, it was used extensively in industry during World War II. The need for atomic research, plus the fact that beryllium is an excellent source of neutrons, has established this metal as a permanent industrial hazard. Since World War II, experimental work on animals and clinical reports of the condi*tion in human beings have multiplied to* such an extent that one can mention only the most important facts as to toxicity.

Beryllium is an element with the atomic weight of 9 and the atomic number 4. Of the four known isotopes, Be^7 is the most useful. Be^7, with a half life of forty-three days, is destined to play a greater role in future research as a tracer. It can be used in experimental animals in the study of histopathology and in final determination of the minimal tissue dose toxicity. Beryllium is used chiefly in the form of compounds, particularly beryllium oxide, zinc beryllium silicate, and phosphor powders containing beryllium for fluorescent lights and copper alloys, and also as alloys with other metals for manufacture of fine wires and filaments. As a result of the greater use of the metal, a number of plants are producing beryllium from beryl ore. In the vicinity of one of these plants a number of neighborhood cases had developed; the patients were nonworkers who were exposed to air polluted with beryllium fumes within a radius of 4,000 feet. One case was reported two miles away from the plant—a worker's wife had contracted berylliosis by cleaning and washing her husband's overalls. This series of important cases was reported by Eisenbud and his associates.[4] They were able to establish the minimal atmospheric pollution necessary for development of the disease to be about 0.1 microgram of beryllium per cubic meter, and suggested 0.01 microgram as a permissible atmospheric pollution. In their experience no cases of berylliosis have developed in the vicinity of the plant where the atmospheric pollution was found to be 0.001 microgram of beryllium or less. They have also shown experimentally that by cleaning the overalls, one can inhale 17 micrograms of beryllium per

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**We are indebted to H S Martland, M D, Chief Medical Examiner of Essex County, Newark N J, for permission to use autopsy records in this case

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A Matter of Opinion

Good opinion is not flabby and uncertain. It is not a "much to be said on both sides." It is a provisional conviction to be held as a conviction until new light alters it. It is an interpretation with a definite slant and bias. But it presses hotly for proof. It strains constantly toward the accuracy of truth. Good opinion, although firm, is the direct opposite of dogma. Dogma is hard and unyielding, a sort of petrified emotion. It is constantly masquerading as proof, as genuine opinion never does. You do not revise dogmas. You smash them. But opinion is flexible and gracious. It does not object to examining itself, to publishing the source of its interpretations. It takes you freely behind the scenes. It is not afraid to show you the foundations of the categories and terms in which it is expressed. It will let the bony framework of its presuppositions stand out rather boldly at times. It invites criticism. It has the scientist's disinterestedness in its own conviction. What it wants is to understand, to get the thing it is judging rightly placed, to grasp its true meaning in the world.

Opinion, however, aims not at a mere static comprehension. It does not merely survey the field with serene Olympian gaze. It is a force, and the only force that can be relied upon in the long run to fortify the will and clear the vision. Conviction, gripped after the widest possible survey of the field, is what we must act upon if we are to effect those social changes which most of us desire. The world has generally preferred to act from logical consistency or from the high elation of feeling rather than upon daring and clear-sighted experiment. The idea of a social and political opinion which, free from moral prejudice, strains toward scientific proof, as the hypotheses of the physicist strain toward physical laws, is still very new, but it is already playing havoc with the old crusted folkways.

—*J. Randolph Bourne*

Berylliosis and Silicosis

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SINCE World War II, the hazard of beryllium poisoning has become well known in industry Prior to that time there were sporadic cases cited in the European literature Gelman[1] and others reported a number of cases of beryllium poisoning in workers from beryl ore mines in the Ural Mountains In his report to the League of Nations, he described all the phases and variants of the disease as it is now known in the United States Even the neighborhood cases were correctly described by him If there were any cases in the United States prior to World War II, they were not recognized One such case, observed in New Jersey, was cited by Martland[2] in his paper on "Occupational Beryllium Poisoning in New Jersey" ** In that report, Martland included a case brought to him as Chief Medical Examiner of Essex County by R Pomeranz[3] That case had been reported by Pomeranz as "nickel poisoning and productive miliary tuberculosis" Further studies by Gardner and Martland and the history of exposure to beryllium finally established this as a case of berylliosis It was the first reported case of beryllium poisoning in New Jersey before World War II Additional patients with berylliosis contracted before World War II and treated for many years with the diagnosis of chronic tuberculosis came to autopsy last year and will be reported later

Because of the excellent metallurgic properties of beryllium, it was used extensively in industry during World War II The need for atomic research, plus the fact that beryllium is an excellent source of neutrons, has established this metal as a permanent industrial hazard Since World War II, experimental work on animals and clinical reports of the condition in human beings have multiplied to such an extent that one can mention only the most important facts as to toxicity

Beryllium is an element with the atomic weight of 9 and the atomic number 4 Of the four known isotopes, Be is the most useful Be , with a half life of forty-three days, is destined to play a greater role in future research as a tracer It can be used in experimental animals in the study of histopathology and in final determination of the minimal tissue dose toxicity Beryllium is used chiefly in the form of compounds, particularly beryllium oxide, zinc beryllium silicate, and phosphor powders containing beryllium for fluorescent lights and copper alloys, and also as alloys with other metals for manufacture of fine wires and filaments As a result of the greater use of the metal, a number of plants are producing beryllium from beryl ore In the vicinity of one of these plants a number of neighborhood cases had developed, the patients were nonworkers who were exposed to air polluted with beryllium fumes within a radius of 4,000 feet One case was reported two miles away from the plant—a worker's wife had contracted berylliosis by cleaning and washing her husband's overalls This series of important cases was reported by Eisenbud and his associates[4] They were able to establish the minimal atmospheric pollution necessary for development of the disease to be about 0 1 microgram of beryllium per cubic meter, and suggested 0 01 microgram as a permissible atmospheric pollution In their experience no cases of berylliosis have developed in the vicinity of the plant where the atmospheric pollution was found to be 0 001 microgram of beryllium or less They have also shown experimentally that by cleaning the overalls, one can inhale 17 micrograms of beryllium per

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**We are indebted to H S Martland MD Chief Medical Examiner of Essex County Newark N J for permission to use autopsy records in this case

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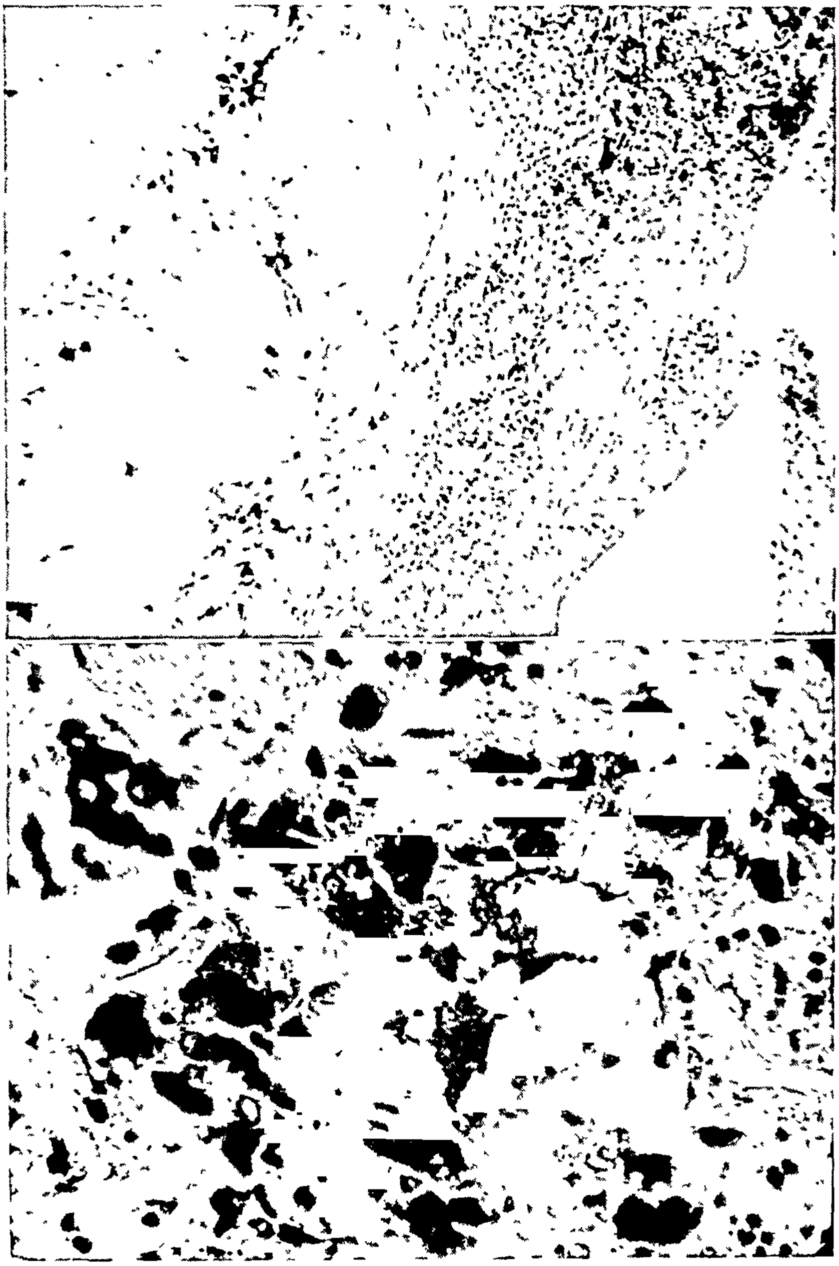

Fig. 3—*Top*, Large hyalinized silicotic nodule, × 100. *Bottom*, Conchoidal bodies within a large giant cell, stained blue. × 450.

nent left ventricle. The aorta was moderately dense and of normal width. The trachea was slightly pulled over to the right. Both lungs showed dense hilar shadows, a markedly increased vascular pattern bilaterally, and obliteration of the normal vascular pattern in the midzones by numerous coalescing nodules. These nodules were seen in all parts of the lungs, but apparently more on the right. They obliterated the trunk shadows at both bases medially.

The 1949 films (Fig. 2) showed definite enlargement of the cardiac silhouette as compared with that observed on previous study. There was marked increase in the nodules, and interstitial changes were noted throughout both lungs and both bases. The hilar shadows were more dense. The nodules were very dense, and some of them were fairly sharp, others had variable borders and shapes No cavities were seen The cardiohilar spaces were obliterated

The case was referred for autopsy to Dr Martland as Chief Medical Examiner

Autopsy—The body presented a well developed muscular frame, poorly nourished, with slight clubbing of fingers and toes and a large inguinal hernia The abdominal cavity contained 1 quart of clear straw-colored fluid, there was no evidence of bowel obstruction The heart measured 12 by 14 by 9 cm and weighed 500 Gm The heart was broadened The right ventricle was of good consistency, measured 0 5 cm and showed no evidence of fibrosis or hemorrhage All valves were free The aorta showed slight atheroma and measured 2 5 cm

Lungs—The left lung weighed 775 Gm The tissue was dark reddish gray, cut with difficulty and showed diffuse nodulations and fibrosis throughout the entire parenchyma There were no cavities The nodules measured about 0 5 cm in diameter There were no cavities The nodules measured about 0 5 cm in diameter There were numerous emphysematous bullae along the edge of the lungs The bronchi were dry, the mucosa was congested, and the hilar nodes were enlarged The right lung was the same as the left There were dense pleural adhesions near the right apex

Other Organs —The spleen weighed 185 Gm and showed a firm pulp The kidneys had a granular surface The liver weighed 1,500 Gm and showed rounded edges, the capsule was smooth except for diffuse granulations, its tissue cut with considerable resistance The gallbladder was thickened and fibrous and showed about 30 faceted stones The brain substance showed diffuse edema There were no hemorrhages or tumors The spinal fluid was increased in amount The basal vessels were moderately calcified

Microscopic Observations (Fig 3) —The entire lung showed extensive interstitial fibrosis with numerous nodules, so that very little aerated tissue remained The nodules were fairly large, composed of many smaller ones, and were hyalinized The remaining alveoli showed in some places emphysema and in other places edema, the nodules and the interstitial septums contained a great deal of anthracotic and blood pigment In many places one could see conchoidal bodies which were stained blue Giant cells of the Langhans type were visible throughout the lungs The liver showed passive congestion and occasional granuloma

Toxicologic Observations—The toxicologic picture is summarized in Tables 1 and 2 This analysis indicates a silicotic lung The proportion of mineral solids is far beyond that of any specimen ever handled in the same manner in this laboratory before

TABLE 1—*Toxicologic Observations (F Dutra)*

	Weight, Gm	Micrograms of Beryllium in sample	Micrograms of Beryllium in 100 Gm
Liver	20	1 14	5 7
Kidney	25 6	0 69	2 7
Lung	23 6	2 0	8 5
Lymph nodes hilar	5 5	2 3	41 8

TABLE 2—*Toxicologic Observations (J B Brady)*

Beryllium found	
Liver	2 9 gamma
Kidney	2 6 gamma
Spleen	1 1 gamma
Lung (in formaldehyde)	9 1 gamma
Silica found	
Lung in formaldehyde	100 Gm
Sample taken	
Air dried	30 Gm
Ash	5 8 Gm
Acid insoluble	45 76%
Silica	38 36%
Per cent of silica in dry lung	7 38
Per cent of ash in dry lung	19 3

COMMENT

Review of the roentgen data failed to disclose any definite evidence of the characteristic snowstorm appearance associated with chronic beryllium poisoning The nodules varied in size and shape and no definite etiologic conclusions could be drawn from their appearance Also worthy of note was the definite progression of the disease between the two examinations, both in the lungs and in the size and shape of the heart Toxicologically, the glands contained most of the beryllium and the lungs contained ten times the normal amount of silica It seems that exposure to silica was more pronounced than to beryllium For a complete diagnosis, correlation with the occupational history is of paramount importance tention. An abdominoperineal resection for carcinoma of the rectum had been performed eight years earlier.

In all 3 cases the gland was removed within two weeks, at which time the fistulous tract was excised and the bladder closed before prostatectomy was performed.

Stay in Hospital.—Fifty-three patients spent 968 postoperative days in the hospital, or an average of eighteen and three-tenths days each. This included a stay of forty-two days by the patient with the hip fracture; a stay of forty-six days by the patient in Case 1 of the two-stage operations; and respective stays of forty-six and forty-three days by 2 men over the age of 80, who were unable to have care at home. Most of the men in the younger age brackets left between the eighth and the twelfth postoperative day.

Mortality Rate.—There were 2 deaths in the series, a mortality rate of 3.8 per cent. The first patient, a man aged 58, died on the twelfth postoperative day from pulmonary embolism. He had cardiac disease and was kept in bed ten days after the operation because of this. The second patient, aged 80, died suddenly on the twenty-fifth postoperative day from acute coronary disease. He was up and about and doing well at the time. He had been kept in the hospital for lack of home care.

Postoperative Complications and Sequelae.—The following complications were noted:

Acute epididymitis, 1 case. The patient objected to ligation of the vas.

Pulmonary atelectasis, 1 case. The patient, aged 77, was hospitalized for forty-three days after operation.

Urethrorectal fistula, 1 case. This was the case of frank malignant disease. The gland and capsule were removed by the Millin technic. The fistula closed spontaneously. The postoperative hospital stay was thirty days. The patient lived eighteen months. There was no local recurrence or stricture formation.

Urethral stricture, 1 case. This was the only known case of urethral stricture. The patient had benign hypertrophy with associated adenocarcinoma. The stricture occurred fourteen months after the operation. Recent resection of the obstructing tissue in the prostatic bed with the Thompson resectoscope showed it to be malignant.

Acute thrombophlebitis, 2 cases. In 1 case this occurred on the seventeenth day and in the other on the nineteenth.

Acute retention, 1 case. Four weeks after the operation there developed acute retention of urine, requiring catheterization. Marked pyuria was present, which cleared rapidly on administration of sulfa drugs.

Stone formation, 2 cases. Both patients had pain and frequency. In the first case the complication occurred eight weeks after the operation, with several small stones in the prostatic cavity. In the second it occurred twelve weeks after the operation, with a small stone in the bladder. Both patients were relieved when the stones were removed per urethra.

Retained oxycel, 1 case. This patient, after the operation, had bouts of pain and frequency with chronic pyuria. He would permit no investigation for nine months, after which time a large piece of oxycel was found in the prostatic cavity. It required removal through the bladder.

Dribbling of urine, 3 cases. For varying periods up to four weeks, 3 patients complained of dribbling of urine when they were upset or under strain, as in crowds, conducting business, coping with family discords, etc. When quiet, they had complete control. They had two things in common; their ages ranged from 75 to 80, and they were all of nervous temperament.

The diagnosis of prostatic obstruction and the indications for surgical intervention are not within the scope of this paper. However, once a diagnosis is made and relief indicated, the patient is prepared for operation. This preparation consists largely in assessing the patient's condition; combating anemia, dehydration, and starvation, and using an indwelling catheter if the bladder retention is marked and the obstruction not complete. Prothrombin levels are studied and blood made ready In my experience, while the hazards of surgical treatment increase with age, the aged withstand it well provided they are not allowed to develop shock The reversal of shock is much more difficult and hazardous in the aged, and the balance is easily tipped by excessive use of intravenous fluids, the tendency to pulmonary complications, the dangers of barbiturate sedation, etc The less these patients are restrained, the better Early ambulation, encouraging them to eat and drink, and the use of mild sedatives, such as aspirin, empirin compounds, bromides, and morphia in moderate doses, are important in the after-care of these patients

Preoperative Sedation and Anesthesia —Demerol 1½ cc with atropine gr 1/200 has been the usual preoperative sedative medication Light nupercaine spinal anesthesia up to about the eighth thoracic level, with light narcosis by nitrous oxide and oxygen, supplemented with small doses of pentothal given intravenously, have been the anesthetic agents of choice

Operative Technic —After the patient is anesthetized a catheter is passed, emptying the bladder The catheter is then removed The patient is now placed in the Trendelenburg position, and the skin of the abdomen, penis and scrotum is prepared in the usual manner Skin drapes are placed in such a manner as to leave the penis accessible between towels

The cutaneous incision is low and transverse, at the pubic hair line It curves slightly to just beyond the outer edges of the recti, the combined tendinous fibers of the recti are next divided in the line of the cutaneous incision and laterally to the recti, the combined tendinous fibers of the external oblique, the internal oblique and the transversus abdominis muscles, which form the anterior sheath of the recti, are further divided for about 1 inch (2 5 cm)

The vas deferens is now picked up in either angle of the incision It is then crushed, divided and ligated To do this, the rectus muscle is retracted medially, and the line of the inferior epigastric artery is noted Just lateral to the origin of the artery at the site of the internal inguinal ring, the transversalis fascia is nicked, and the vas is picked up as it curves laterally around the artery Its position is constant and is readily found At this point one should be on the watch for a prolongation of the peritoneum into the inguinal canal It is easily opened into, and should be immediately resutured if this is done A hernia, if present, may be repaired by the McVay technic, working from the posterior wall of the inguinal canal

The divided rectus sheath is now elevated above and below the line of incision, and the recti muscles are separated in the middle line, carrying the separation well down to the pubic bone This opens up the space of Retzius and exposes the inferolateral surfaces of the urinary bladder The bladder is now swept upward with the hand, and the retropubic space is exposed At this point the Millin self-retaining retractor is put into place, the lateral blades retracting the recti and the middle blade the bladder Before the middle blade is applied, a narrow rolled taped sponge is placed in the inferolateral surfaces of the bladder, and over this is placed the blade The blade is then strongly retracted upward, carrying the body of the bladder out of the field and exposing the bladder neck, the sphincteric ring and the prostatic capsule

The loose fatty tissue on the anterior surface of the prostatic capsule is now brushed aside, clearing the capsule Any veins that will not retract out of the field may be ligated or fulgurated I have not seen edema of the penis result from this, although these veins drain the dorsal vein of the penis The landmarks are now well visualized, the prostate may be palpated in its entirety, and its size, contours and firmness may be noted The levators are not exposed

An incision is now made in the midline of the prostatic capsule, commencing about the midpoint of the capsule and running up to and including part of the sphincteric ring The incision is deepened until the glistening white fibers of the gland are exposed. The cut edge of the capsule is picked up on either side with tissue forceps and is dissected off the gland for a short distance with the long curved scissors. The incision is now continued upward in the midline, completely dividing the sphincteric ring and the whole thickness of bladder wall for about 1 inch (2.5 cm.). Any urine in the bladder is removed by suction.

The sphincteric ring is now dissected free on either side from the gland as far as the lateral angles. At the same time the bladder mucosa is divided as it is reflected onto the intravesical portion of the lateral lobes. Catgut sutures are now placed in the cut ends of the sphincteric ring for retraction purposes. They are fastened to the retractor on either side.

The lateral lobes of the gland are now dissected free of the capsule on the anterior, lateral and posterior surfaces. A combination of the finger and the long curved scissors is used. In freeing the gland anteriorly below the level of the incision, one must be careful not to extend the incision downward by tearing the capsule during the dissection. Careful use of the scissors will avoid this.

When the dissection is completed, the index finger can easily identify the tip of the gland and the prostatic urethra as it enters the urogenital diaphragm. The gland is now seized with a pair of tenaculum forceps and elevated, the urethra being put on the stretch. The urethra is now cut close to the gland, with the long curved scissors guided by the index finger. The gland can now be elevated from its bed, and a taped sponge is inserted into the cavity to control any oozing.

As the gland is elevated, the capsule is stripped clear posteriorly, and at the posterolateral angles the pedicle blood supply is clamped on either side and divided. A short curved gallbladder or tonsil forceps works well for this purpose. With the scissors, the posterior portion of the sphincteric ring is now dissected free from the gland, the remaining portion of the bladder mucosa being divided at the same time. The gland is then removed.

The blood-supplying vessels are now ligated with catgut on a needle. The taped sponge is removed and the cavity carefully inspected for remaining prostatic tissue. The capsule should be perfectly smooth. Any bleeding points are picked up and ligated as in a tonsil bed.

The center of the posterior portion of the sphincteric ring is now caught with a tenaculum forceps and lifted up for inspection. If there is redundant tissue here, a wedge is excised with the scissors. I now tack the cut bladder mucosa down to the muscle of the sphincteric ring, using interrupted gastro intestinal sutures on a curved needle. This controls any oozing and makes for a neater-looking job. The interior of the bladder is now inspected and freed of all clots.

A three-way Foley catheter is next passed through the penis into the prostatic cavity with the tip in the bladder. I use a size 18 with a 30 cc. bag. The bag rests in the prostatic cavity and is tested for inflation and required size. The bag requires only partial inflation, as several strips of gelfoam may be placed about it to control any oozing in the cavity, and at the same time there is sufficient room to allow the prostatic capsule to contract. I have used the bag both in the bladder and in the prostatic cavity, and I favour the latter, as I feel it controls oozing best.

The prostatic sheath is now closed with interrupted catgut sutures placed with an ordinary needle on a long needle-holder. The sphincteric ring and the bladder wall are closed with interrupted tantalum wire, placed deep to the level of the bladder mucosa. Before the last bladder suture is tied, all clots are removed. As the patient is in the Trendelenburg position, any oozing will tend to run into the bladder and form clots, and they should be removed just before closure. The bag of the Foley catheter is now inflated to the estimated degree.

The retropubic space is now cleared of all clots, and sulfa powder is dusted in. The retractor is removed and the patient placed in the horizontal position. A rubber sump drain is inserted down to the prostatic sheath

The rectus sheath is closed about the sump drain with interrupted catgut, and the skin is closed with interrupted cotton

The Foley catheter is connected to an apparatus for gentle suction, and several syringes of saline solution are run through the catheter, making sure it is clear of clots, and also that the bladder is free and bleeding is under control

The patient, who should be completely aroused by now, is returned to his bed Blood loss and shock have been minimal The Foley catheter is connected to a sulfanilamide drip and a Gomco suction apparatus The sump drain also is connected to the latter The patient is free to turn in bed, to sit up or to stand by the side of the bed The irrigation is run continuously for forty eight hours, the rate depending on the amount of blood in the return If it appears to be considerable, the rate is increased During the first twenty-four hours the catheter is syringed often to make sure it is free of clots and has a free return flow In 2 cases the return flow became blocked and the irrigating solution returned via the sump drain In both cases the bladder apparently collected sufficient clots so that the irrigating solution was forced out through the bladder incision In each case the bag was deflated and the catheter inserted well into the bladder The clots were then removed by syringing, the bag was reinflated and allowed to remain in the bladder Irrigation and suction were then continued in the usual manner It is therefore important to see that the return flow is via the catheter and not the sump, although some attendants think that is what the sump is put there for

In the average case the continuous irrigation is stopped on the second postoperative day, and syringe irrigation is carried out every six to eight hours until the catheter is removed on the third or fourth postoperative day I like to leave the sump drain in for one day after the catheter is removed If any leakage of urine occurs, I then reinsert the catheter for another three or four days This occurred in 1 case only

The patient is allowed to become ambulatory on the third day, and every effort is made to get him back to his normal routine of eating, drinking and bathroom privileges A fluid balance chart should be maintained for several days, however, as a great deal can be taken for granted with these older patients, and they can easily slip into a dehydrated state

Penicillin was used routinely in postoperative care until the temperature was normal Mandelamine tablets, 2 q i d , have been the routine urinary antiseptic, until all pyuria has cleared Pyuria, as a rule, has persisted up to three or four weeks If it persists beyond this, there must be a reason, and it should be investigated cystoscopically

SUMMARY

1 A method of retropubic prostatectomy is described Although this method is a modification of the Millin technic, the author considers the changes important enough to be recorded

2 The method allows excellent exposure and anatomic dissection and positive control of bleeding, with minimal shock to the patient

3 The method appears equally applicable in all types of prostatic obstruction and gives complete coverage in this field to the general surgeon or urologist who is not trained in the highly specialized field of transurethral resection

4 The gland is completely removed, and there is no tendency to stricture formation Post operative urethrograms show the prostatic cavity to be confluent with the urinary bladder

5 Nursing and hospital care are minimal and well suited to a general hospital Confinement to bed has been shortened, with an early return to normal micturition For the patient this all leads to better morale and easier economy

6 Sexual function has not been disturbed

RESUMÉ

1 On decrit ici une technique de prostatectomie retro-pubienne Cette tech-

nique, une modification de celle de Millen, est, de l'avis de l'auteur, assez importante pour être mentionnée.

2. Par sa méthode, l'auteur prétend avoir un meilleur champ de vision, une dissection plus anatomique, un contrôle parfait de l'hémostase et presque sans shock pour le patient.

3. Cette méthode s'applique à tous les types d'obstruction prostatique et est de tout repos pour le chirurgien ou l'urologiste non entrainé à la résection transuréthrale.

4. L'adénome est tout enlevé; il n'y a pas de prédisposition au rétrécissement. Une uréthrographie post-opératoire montre que la vessie fait suite à la loge prostatique.

5. Les soins post-opératoires ne sont pas compliqués pour un hôpital général. Le repos au lit est abrégé et le malade s'alimente plus vite. Le patient bénéficie de la sorte d'une quiétude d'esprit et d'une économie pécunière.

6. Il n'y a aucune perturbation de la fonction génitale.

RESUMEN

1. Se describe un método de prostatectomía retropúbica. El autor considera los cambios bastante importantes para ser mencionados, dado que este método es una modificación de la técnica de Millin.

2. El método permite exposición y disección anatómica excelentes y hemostasis efectiva, con choque mínimo para el paciente.

3. El método parece igualmente aplicable en todos los tipos de obstrucción prostática, poniendo completamente a cubierto en este campo al cirujano general o al urólogo no adiestrado en la rama altamente especializada de la resección transuretral.

4. La glándula es completamente extirpada y por ende no existe tendencia a la formación de estenosis. Uretrogramas postoperatorios muestran la confluencia de la cavidad prostática con la vejiga urinaria.

5. Los cuidados del enfermo son mínimos y bien adecuados a un hospital general. Acortamiento de la permanencia en cama, con pronto retorno a la nutrición normal. Todo esto redunda en mejor moral y desahogada economía para el paciente.

6. La función sexual no ha sido trastornada.

RIASSUNTO

1. Descrive un metodo di prostatectomia retropubico. Mentroche' questo metodo sia una modificazione della tecnica ri Millin, l'A. considera i cambii cosi importante di registrarli.

2. Il metodo permette eccellente esposizione e dissecazione anatomica e controllo assoluto dell'emorragia, con minimo shock al paziente.

3. Il metodo appare ugualmente applicabile in tutti tipi d'imbarrazzo prostatico e da' complete rifugio in questo campo al chirurgo generale od urologo chi non e' istruito nel ramo specializzato della risezione transuretrale.

4. La ghiandola e' interamente rimosso, e non c'e' tendenza di formazione stenosante. Uretrogramme postoperatorie dimostrano il cavo prostatico confluente alla vesica orinaria.

5. Cure da guardinfermi ed ospedale sono minimi e convenevole ad un ospedale generale. Constringimento al letto veune abbreviato, con restituzione precoce a nutrizione normale. Pel paziente tutto questo spinge a morale migliore ed economia piu agevole.

6. Lafacolta' sessuale non e' stata disturbata.

ZUSAMMENFASSUNG

1. Es wird eine Methode der retropubischen Prostataresektion beschrieben. Die Methode stellt zwar nur eine Modifikation der Millinschen Technik dar, aber der Verfasser haelt die Abaenderungen fuer wichtig genug um veroeffentlicht zu werden.

2. Die Methode gestattet eine ausgezeichnete Freilegung und anatomische Praeparierung sowie eine positive Blutstillung unter aeusserst geringer Schockwirkung fuer den Kranken.

3. Die Methode zeigt sich als gleich-

maessig anwendbar bei allen Formen prostatischer Obstruktion und deckt auf diesem Gebiet alle Ansprueche des allgemeinen Chirurgen oder des Urologen der in der hoechst spezialisierten Technik der transurethralen Resektion nicht geuebt ist

4 Die Druese wird vollstaendig entfernt, und es besteht keine Neigung zur Entwicklung von Strikturen Post operative Roentgenbilder der Harnroehre zeigen, dass die Prostatahoehle frei in die Harnblose uebergeht

5 Die erforderliche Nachpflege im Krankenhaus ist aeusserst gering und fuegt sich leicht in den Rahmen eines allgemeinen Krankenhauses ein Die Dauer der Bettlaegerigkeit kann abgekuerzt werden, und eine fruehzeitige Rueckkehr zu normaler Ernaehrung ist moeglich Dies alles hat einen guenstigen Einfluss auf die Moral des Kranken und erleichtert seine finanzielle Buerde

6 Die Geschlechtsfunktion wird nicht gestoert

SUMARIO

1 Um metodo de prostatectomia retrapubica e descrito Embora este metodo seja uma modificaçao da tecnica de Millin o autor considera as alteracões suficientemente importantes para serem relatadas

2 O metodo permite excelente exposição e dissecção anatomica, como tambem perfeito controle do sangramento e choque minimo

3 O metodo e aplicavel em todos os tipos de obstrução prostatica e proporciona amplo campo operatorio ao cirurgiao geral ou urologista não treinado em tecnicas altamente especializadas de ressecçao trans-uretral

4 A glandula e completamente removida e não ha tendencia a formação de estreitamentos Uretrogramas pos operatorios demonstram a confluencia da cavidade prostatica com a bexiga

5 A enfermagem e os cuidados hospitalares são diminutos e não requerem hospital especializado O periodo de hospitalização foi reduzido, com precoce retorno a micção normal Tudo isso redunda em economia e conforto moral para o paciente

6 A funçao sexual não foi perturbada

REFERENCE

Millin T Retropubic Urinary Surgery Edinburgh E & S Livingstone Ltd 1947

LA PRESSE MEDICALE

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The Problem of the Thyroid Gland from the Standpoint of the Anesthesiologist

JOHN S. LUNDY, M.D., F.I.C.S. (HON.)
ROCHESTER, MINNESOTA

As a rule, the thyroid gland is a matter of concern to the anesthesiologist only when it is abnormal. Medical management of a diseased thyroid gland and preoperative preparation of the patient, except for preoperative sedation, have not been our concern and will not be considered here. Tumors of the thyroid gland do become our problem, however, if the patient suffers simultaneously from some other surgical condition and if a decision is made to operate on the associated lesion prior to surgical treatment of the tumor of the thyroid gland. It is then that the choice of the anesthetic and its management become important. This is equally true when surgical treatment of the thyroid gland is to be undertaken, especially if the tumor is large and regardless of whether or not it is malignant. An indirect problem related to the thyroid gland is presented by the patient with paralysis of the vocal cords caused by previous operation for goiter. Anesthesiologists are particularly concerned with patients who subsequently must undergo such operations as appendectomy or an emergency operation for fracture. Again the choice of anesthesia becomes involved, particulaly for the King operation or for partial excision of the arytenoid cartilage by the Lynch suspension method.

Essentially, the anesthesia for thyroidectomy is aided by complete cooperation with the surgeon in whatever technic he prefers. If he wishes the patient to be able to speak at any time during the operation, obviously he must depend on local anesthesia, with or without the administration of nitrous oxide and oxygen plus preliminary medication (1½ gr. of pentobarbitol sodium administered by mouth the night before operation and the morning of operation, plus a hypodermic injection in the morning of 1/6 to 1/4 grain [0.01 to 0.016 Gm.] of morphine and 1/150 grain [0.00043 Gm.] of atropine).

Infiltration of the line of incision and subsequent infiltration, as the operation progresses, of the tissue to be incised has been carried out on numerous occasions and seems to provide a drier field than is obtainable when infiltration is not employed. As a rule epinephrine is not added to the local anesthetic solution, which need not be stronger than 0.5 per cent procaine or metycaine. I have felt that there was some advantage in infiltrating the line of incision in the field of operation with a solution of procaine containing cobefrin in a dilution of approximately 1:67,000, plus bilateral superficial cervical block. The benefit seemed to be in having some local vasoconstriction without untoward systemic effects.

If failure is encountered with local anesthesia, it is usually because the solution has not been deposited sufficiently on the surface or in and under the skin in order to take care of the pain of the skin incision. Deposition of the anesthetic solution deep into the tissues without superficial infiltration is the usual reason for failure when a local anesthetic is used for making the incision for thyroidectomy.

After the incision has been made, however, and traction is applied to the gland, the patient often complains of distress. It is at this time that nitrous oxide plus oxygen is administered in percentages which allow for at least 20 per cent oxygen in the mixture. The cessation of gas anesthesia soon allows the patient to

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From the Section on Anesthesiology, the Mayo Clinic.

Read at the Fifteenth Annual Assembly of the United States Chapter, International College of Surgeons, Cleveland, Nov. 1, 1950.

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awake, so that he should be able to use his voice. This type of anesthesia is one I am accustomed to for an uncomplicated case, but if the thyroid gland has been large enough to press on the trachea and *to soften it much it is not uncommon for* the patient to have difficulty in inhaling after most of the gland has been removed and the trachea is no longer splinted by the thyroid tissue. When this happens the trachea tends to collapse as the patient inhales, and the anesthesiologist must be *prepared to insert an intratracheal tube.* This is best done through the mouth. Most intratracheal tubes are not quite long enough, if inserted through the nose and into the trachea, to reach past that portion of the trachea which is collapsed, whereas intubation through the mouth *can be carried out so that the tip of the* intratracheal tube reaches almost to the bifurcation of the trachea, making it possible under most conditions to establish an airway.

This same technic of intubation is the one I would recommend for those who wish to anesthetize patients and to operate on them with the use of a general anesthetic from the beginning. In other words, the safest procedure for the patient is oral rather than nasal intubation when general anesthesia is employed for thyroidectomy.

The modern management and preoperative preparation of patients with goiter has greatly simplified the problem for the anesthesiologist. At the time of operation rather crowded conditions may exist at the head of the table, and it has not been too simple to find the means of separating *the surgical field from the space occupied* by the anesthesiologist. I have made an effort to do this by the use of an anesthetist's screen, which is illustrated in Figures 1 and 2. Although the screen was not designed for this particular use, I find it a valuable solution of the problem of separating the two fields just mentioned. The sterility of the operative field is easily preserved by the drapes being placed over the screen, which adequately separates the sterile from the unsterile field. The uprights are close enough to *the patient's head so that they do not* interfere with the assistants making retraction in the wound or carrying out other manipulations. The fact that the patient's face is hidden from the surgeon can be overcome only by either having him step away from his position for a moment to *look around the drape or by attaching* a mirror to the screen, so that he may see the patient's face reflected in the mirror.

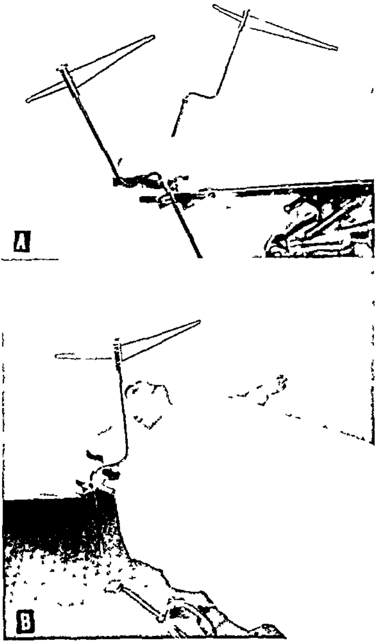

Fig. 1.—*A*, the two sections of the anesthetist's screen are shown attached by clamps to the side rail of the operating table to illustrate some of the many positions in which the screen can be placed. *B*, half of the anesthetist's screen in *place as it is used for radical amputation of the* left breast.

Of the various anesthetics that have been used for patients undergoing thy-

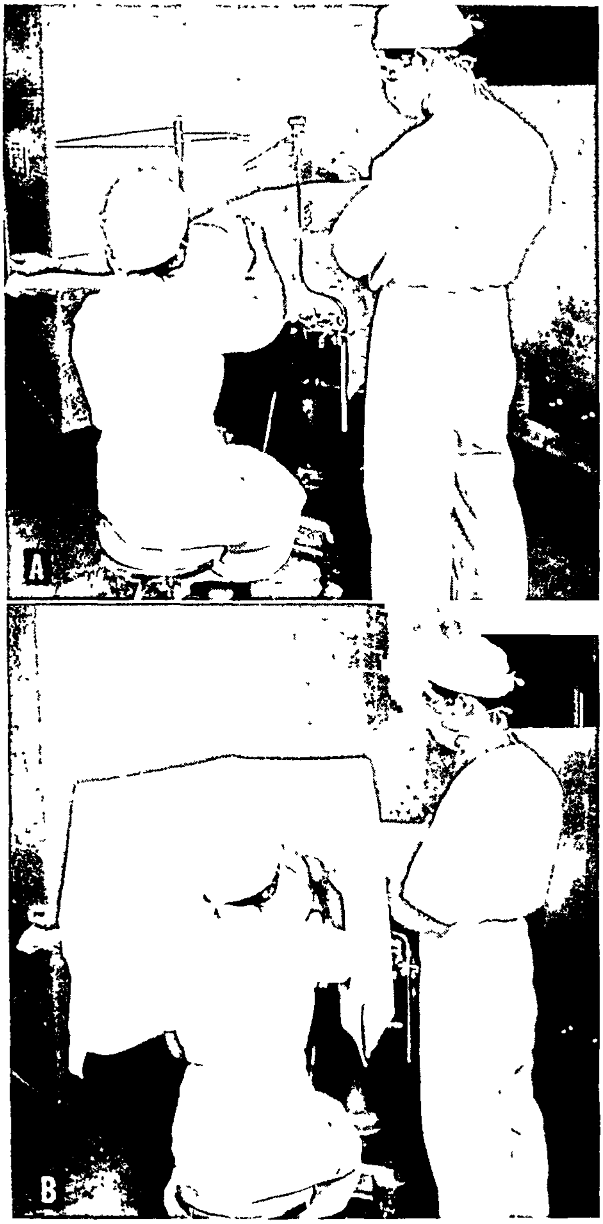

Fig. 2.—*A*, the screen in the usual position for laparotomy. The nurse sits in the position usually occupied by the anesthetist, and the man is standing in the position occupied by an assistant when holding a retractor. The additional space allowed by the screen for this maneuver can be seen. *B*, the screen has been covered with a drape; otherwise, the scene is the same as in Figure 2A.

roidectomy I already have indicated my preference. I have not been impressed with the reports of the use of cyclopropane for this purpose. In my opinion ethylene was and is a good anesthetic for these patients, particularly if there is a coexistent cardiac condition, but nitrous oxide-oxygen plus a small amount of ether is a most satisfactory anesthetic for this operation if general anesthesia only is to be used. The rectal method of administering anesthetics in analgesic doses can be used, but I have not felt the need of it, especially since preoperative preparation has been effective in decreasing the agitation of the patient and the risk of operation as well. I have not felt that intravenous anesthesia was indicated unless the patient was intubated before the operation started.

SUMMARY

The author summarizes his opinion concerning the anesthetization of patients when the thyroid gland has become a factor in the choice and management of anesthesia.

RIASSUNTO

L'A. pone in sommario sua opinione sopra di anestettizzazione dei pazienti quando la ghiandola tiroidea diviene un fattore nella scelta e nel conducimento di anestesia.

RESUMEN

Se resume la opinión del autor para la anestesia de pacientes en que la glándula tiroides es un factor para la elección y administración anestésicas.

RÉSUMÉ

L'auteur résume ses opinions sur l'anesthésie à employer hez les patients subissant une intervention sur la glande thyroide.

ZUSAMMENFASSUNG

Der Verfasser aeussert seine Ansicht ueber die Narkotisierung von Kranken, bei denen die Schilddruese eine wesentliche Rolle in der Auswahl und Durchfuehrung der Narkose spielt.

SUMÁRIO

O autor resume sua opinião relativa a anesthesia de pacientes nos quais a glandula tiroide se tornou um fatôr na escôlha e manejo da analgesia.

The Concept of Mobilization and Its Relation to Poliomyelitis

HARVEY E. BILLIG JR., M.D.,* F.I.C.S.
LOS ANGELES

THERE has been much discussion concerning the approach to therapy in rehabilitation. One approach is to diagnose the disease (poliomyelitis, Little's disease, hemiplegia, multiple sclerosis, Parkinson's disease, etc.) and then institute whatever therapeutic procedures are known for the condition. The other approach *is to go a step farther and*, disregarding the particular disease, analyze the patient from the standpoint of the particular physiologic and biochemical functions involved.

Following the latter concept as applied to the mobilization of patients with poliomyelitis, it can be noted:

1. *Coming on early in the disease* is a loss of proper functioning of Sherrington's reciprocal innervation reflex, so that the stretch reflex in the opposing muscles is not damped; hence stiffness and so-called muscle spasm ensue. Varying types of this manifestation can be observed in spastic patients and in those with Parkinson's disease, hemiplegia, etc.

Rhythmic, passive, very slow exercise carried out for thirty to forty minutes several *times daily will rapidly restore* this reflex in a patient with poliomyelitis, although it may take consistent repetition for four to six months or more to do so in a patient with Parkinson's disease.

2. When an anterior horn motor nerve cell is killed, the whole motor unit is lost and approximately 120 muscle fibers are left without innervation. After eighteen to twenty-one days they begin to fibrillate and are capable of remaining alive (Golseth, *Weddle and others*).

There is evidence in both animals and man *that remaining* live motor nerve fibers can expand their arborization both spontaneously and after artificial stimulus to resupply denervated muscle fibers (Van Harreveld; Weiss; Billig; Hodes).

Denervated muscle fibers can, in the meantime, best be kept alive by two methods: first, constant heat, and second, the *mechanical stimulus of motion as produced* by passive or active exercise or electrical stimulation.

3. Early in life the ectodermic motor nerve fibers make contacts with already contractible developed mesodermic muscle tissue, and the process of coordination comes into play. The baby in the crib instinctively rocks rhythmically in the knee-chest position and later draws itself up the side of the crib to stand shaking *the crib to rhythm. Still later, at dancing* school, he does exercises to rhythm and completes his sense of coordination.

If the sense of coordination is poor, the child is clumsy and neuromuscular reeducation is impossible.

Active or passively assisted active exercises carried out rhythmically to a set rhythm for thirty to forty *minutes daily* will adequately develop the sense of coordination, taking about a month at 6 months of age, three months at 6 years of age, and ten months at 10 years of age (Billig; Loewendahl).

4. In normal development of neuromuscular control there is a sequence of so-called patterns, by analysis of which one can determine the stage of a child's development as compared to his chronologic *age* (Gesell).

In neuromuscular reeducation this must be kept in mind, for there is no point in presenting exercises to the child in terms of developmental p [illegible] s [illegible] has not yet

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reached. Repetitive proper exercise patterns must be presented in terms of, and preferably in the sequence of, developmental patterns already attained.

5. Superimposed on the basic genetic developmental neuromuscular pattern is an extensive accumulation of conditioned patterns (Pavlov). It is doubtful whether any of these, once developed, is ever completely lost; they are simply overlaid by additional ones as time goes on, and reversion to previous ones can be noted in times of stress; for example, after tendon transplants or in trying to change a baseball batter's stance.

Analysis of the conditioned patterns present is necessary in order to apply neuromuscular reeducation properly. Conditioned patterning comes extensively into play, for instance, in gait training.

6. Endurance is a summation of a number of factors mentioned elsewhere in this paper. Physically speaking, it may be enhanced by a fast, active, rhythmic exercise (Smith—water polo) carried out for thirty to forty minutes daily.

7. For many years "muscle men" have been assiduously tugging on weights, doing bar chinning and push-ups, their muscles meanwhile growing larger and larger and stronger and stronger. Careful measurements and research by DeLorme has shown that hypertrophy of muscle fibers and hence increased power does actually occur and can be therapeutically carried out with reasonable scientific accuracy. Extensive application of this has been carried out for a number of afflictions in addition to poliomyelitis.

8. In the chemical changes of muscular contraction certain basic "muscle foods" are necessary (Borsook). When glycocyamine is fed together with available methyl groups, such as betaine, a progressive increase in muscle power is observed.

9. A number of investigators have recently begun to point out the prevalence of adrenocortical steroid endocrine deficiency in cases of poliomyelitis (Boines; Billig). Szent Gyorgyi, working on muscle fiber metabolism, included mention of the importance of the adrenal steroids to adequate muscle fiber function in his Nobel Prize work of 1944.

10. The great trend toward high protein diets in the presence of debilitation (Sidney Portis) has brought to light interesting developments for use in poliomyelitis. It has now become clear that a diet high in protein and very low in carbohydrate (Billig) will create a positive nitrogen balance, build up muscle (protein) and take off excess of fat even though the caloric intake is not reduced or the amount of fatty foods restricted. This is connected with the liver-pancreas (beta cells of islets of Langerhans insulin production) stimulus by readily available carbohydrate in the diet. In a special way the level of insulin production is connected with the direction of metabolism of foods into fat or protein, hence controlling the nitrogen balance.

11. Orthopedic consideration of mechanical factors, osteotomies, joint stabilizations, tendon transplants, etc., require a widespread knowledge to include careful statistical (Steindler) evaluation of procedures. With children it is always well to keep in mind the consideration of change during subsequent growth. Various equalizations of leg length, such as bone-shortening or bone-lengthening operations, have begun to give way to epiphyseal arrest (Phemister) of the faster-growing leg at the length the slower growing leg is expected to reach by the time its growth ceases. Better statistical data for calculating this is now becoming available. Scoliosis has remained a resistant problem (Cobb), and many analyses of vectors of muscle pull have attempted to show the cause for deviations when weakness in certain muscles supervenes. It may be pointed out that following the old illustration of the spine's mechanical resemblance to a triangular rod, all the pertinent mechanical principles involved in a triangular rod should be taken into account in treatment. These are: 1. When a triangular rod is fixed at both ends, then twisted (rotated) in the center it must also deviate laterally in the center. 2. Conversely, when a

triangular rod is fixed at both ends and then deviated laterally in the center, it must also twist (rotate) in the center Too frequently attempts are made to correct a scoliosis by means of fixing one end of the triangular rodlike spine and then trying to untwist the rotation and correct the lateral deviation In order to correct the scoliosis it is necessary to fix the spine at *both* ends of the curve by teaching the muscles to pull in these two localities in the same direction and then teach the muscles in the region of rotation to pull in the opposite direction (derotation direction) The lateral deviation (scoliosis or curve) will be corrected at the same time Huge amounts of motivation are necessary, however, to keep many of these patients diligent in treatment

12 Finally comes the problem of contractures As ordinarily visualized, contractures of fibrous tissue are too frequently restricted to a few localities, e g, plantar flexion contracture of the foot, flexion contracture of the knee or flexion-abduction contracture of the hip Fibrous tissue is really the connective tissue framework of the body, making up not only the capsule of joints, major ligaments, ligamentum flavum and fascia, but also the compartmentation within the organs surrounding each nerve fiber (neurolemma) and muscle fiber (sarcolemma), etc, and all connecting together as do the walls, ceilings, and floors of a great mansion of many rooms

Passing through foramina in the fibrous tissue layers are the peripheral nerves, coursing from the spinal cord to their peripheral distribution

The marked tendency for poliomyelitics to develop contractures is widely recognized These contractures then cause deformities, and marked crippling occurs In fact, one of the first signs of meningismus presaging an attack of poliomyelitis is a "stiff neck", and sometimes by the time the patient is admitted to the hospital he may be as "stiff as a plank" This is not all muscle spasm, since, as the days go by and muscle spasm recedes, the connective tissue contractures become obvious by the marked restriction of range of motion If this is allowed to remain fixed, contractures will develop and deformities will result

The limitation of range of motion caused by contracted fibrous tissue prevents proper balance and use of the body In other afflictions, such as arthritis, with which contractures tend to develop, painstaking study of the fibrous tissue and its reactions (W W Bauer) has shown that mobilization entails progressive accumulative loosening by means of mechanical passive and active stretching This stretching is repeated frequently, consistently, and each time just a bit past the point of restriction, so that it is carried far enough for a stretch but not for a tear It must be remembered that when muscles are allowed to remain shortened for too long, the fibrous tissue framework in them will contract and it will then be necessary to lengthen this fibrous tissue by the same technic

Considerable light has recently been focused on fibrous tissue by the Nobel Prize-winning work of Hench and Kendall The fact that fibrous tissues, and hence fascia and ligaments, have shortening and lengthening capabilities (contractility common to all protoplasm) has been too little appreciated The remarkable speed with which fibrous tissue physiologically loosens under the influence of the adrenal cortical steroids, as shown by Hench and Kendall, gives a clue to their usefulness in poliomyelitis Hence we have now both a physical therapeutic progressive accumulative loosening by passive and active stretching and an endocrine treatment for correction of contracted fibrous tissue Recently there has been published a guide for mobilization of the various parts of the body (*Mobilization of the Human Body*, Billig and Loewendahl, Stanford Press) and a companion moving picture of the same title (Association Films, Inc) illustrating the technics

SUMMARY

A number of the physiologic functions of the human body are presented, with suggestions as to how therapy directed toward improving their function may aid in mobilization of the poliomyelitic patient.

ZUSAMMENFASSUNG

Es werden Vorschlaege gemacht, wie mittels einer auf die Verbesserung gewisser physiologischer Funktionen des menschlichen Koerpers gerichteten Therapie zur Erhoehung der Beweglichkeit an Kinderlaehmung leidender Kranker beigetragen werden kann.

RESUMEN

Se presenta cierto número de funciones fisiológicas del cuerpo humano, con sugestiones de como mejorarlas terapéuticamente para poder ayudar en la movilización del paciente poliomielítico.

RIASSUNTO

Presenta una quantita' delle funzione fisiologiche del corpo umano, con suggestioni che come terapia diretto verso il miglioramento di loro funzione puo' soccorrere nella mobilitazione del paziente poliomielitico.

RÉSUMÉ

On présente ici quelques unes des fonctions physiologiques du corps humain avec des suggestions pratiques en vue d'aider la mobilisation des patients ayant souffert de poliomyélite.

SUMÁRIO

Um número de funções fisiológicas do corpo humano é descrito, sugerindo o módo pelo qual a terapêutica empreendida no sentido de aumentar a eficiencia dessas mesmas funções póde influir favoravelmente na mobilização de pacientes com poliomielite.

The Sixteenth Annual Assembly
of the United States Chapter
International College of Surgeons

will be held at the Palmer House in Chicago
September 10-14, 1951

For details, write
Dr. Arnold S. Jackson, *Secretary*
United States Chapter, International College of Surgeons
1516 Lake Shore Drive, Chicago 10, Illinois

Editorial

No Comment

On the eighteenth of December in the year 1947, a letter was sent from the International College of Surgeons to the young man with whose portrait we honor this page. The letter was short and carried the season's greetings, although it may not have reached its destination by Christmas; for it had a long way to go. and where it was going the mails were in great confusion.

The letter bore another message as well. It began, "Dear Dr. Wallace: It is our great pleasure to notify you that, at a recent meeting of the International Board of Trustees, you were elected a Fellow of the International College of Surgeons, *with all rights and privileges pertaining thereto. Enclosed is your identification* card, which constitutes a surgical passport among surgeons all over the world."

In due time an answer came, expressing great pleasure; and from time to time came others, though not often. They were never long. There was no time to spare. For Dr. Wallace, then only thirty-eight years old, was serving as head of the surgical *department at the Stout Memorial* Hospital, Wuchow, China, in the line of duty of a Baptist medical missionary. No words were needed to tell us what that meant—the hardships under which his work was done, the unremitting kindness of his nature, the endless patience and fortitude required. From others, never from him, we heard of his devotion. Spokesmen of other faiths forgot their differences, and wrote us of service that filled us with honest pride. Such men as this, we thought, are the soul of the College; in their humility no less than in their strength lies the embodiment of the ideals that beckon us all. We never had a letter from Wuchow without feeling a resurgence of hope for humanity's future.

But we shall get no more letters from Bill Wallace. The Chinese Communist Party, in its valiant endeavors to remake the world, found Bill Wallace's presence in China an inconvenience. He was a living example of all that they abhorred. More than that, he had influence, quiet as he was. No selfless life is devoid of effect upon others.

D[illegible] William L. Wallace

What could be done? There seemed no point of attack. If he would only take sides . . .

But he would not take sides. He was a surgeon. He had no discrimination. To all alike, well-wishers and secret foes, his professional skill and his personal kindness were available. This kept him busier than they approved of.

If he would only [illegible] slip, . [illegible] mething . . .

But whenever he talked, he only talked like a doctor.

If he would show fear, resign and go away . . .

But he would not. Whether he was devoid of imagination and did not see his danger or whether he was so naive as never to have considered the matter at all, the Communists could not decide. But they decided that something must be done, and they set about it with their customary efficiency. Let us hear the rest of the story from an official source, a letter written by Dr. Baker James Cauthen, Secretary for the Orient to the Baptist Foreign Missions Board to Dr. M. Theron Rankin, Executive Secretary: "At 3:00 a.m. on December 19, thirty or forty Communist soldiers came to the entrance of the hospital saying they had a sick man who needed attention. When the door was opened they rushed into the grounds and surrounded Dr. Wallace's house.

"They awakened Dr. Wallace, searched his house, and ordered him to call the staff to the top floor of the hospital. About thirty minutes later, when the entire staff were there together, the Communists asked that two of them go along to witness a careful searching of Dr. Wallace's room. One of the doctors and a pastor were selected, and Dr. Wallace and the servant who had worked with him for many years accompanied them.

"Upon searching the room they found an outboard motor which Dr. Wallace used with his boat. This caused some comment but was quickly explained. Then they searched his bed and found a pistol under the mattress. Dr. Wallace told them that he had never had a gun in Wuchow. The servant said that he had made up the bed every day and he knew the gun was not Dr. Wallace's and had not been in the room before the Communists came. It was evident that the Communists had put the gun in Dr. Wallace's bed during the time the hospital staff was assembled on the top floor.

"Dr. Wallace was taken away about 5:00 a.m. On February 10 he died in a Communist prison. The exact cause of death is not known."

We do not know and therefore cannot tell you what happened during those fifty-three days in prison. Dysentery? Perhaps. Cholera? Again, perhaps. The Communists would know, but they are not talking. All we record here is the bitter fact that in this grim manner ended, in the zenith and prime of manhood, the sacrificial career of William L. Wallace, M.D., F.I.C.S., whose only crime was that he "went about doing good."

—M. T.

The belief in a supernatural source of evil is not necessary; men alone are quite capable of every wickedness.

—Conrad

It is just as well that justice is blind; she might not like some of the things that are done in her name.

—Bagehot

Behold a thing worthy of a god, a brave man matched in conflict with adversity.

—Seneca

We think our civilization near its meridian, but we are yet only at the cock-crowing and the morning star

—Emerson

New Horizons

By the Editor

From Generation to Generation

"Why is it," a nonmedical friend asked us recently, laying down a copy of the *Journal* at which he had been gazing with a respectful but slightly glazed expression, "that once a man enters the medical profession it is almost safe to wager that his sons and his grandsons will follow suit? Is it heredity, or a virus, or what?"

"Let us not call it a virus, if you please; the word is unpleasant. You may call it a contagion if you like, or, better still, an affection. As to your question, the etiologic factors as regards the total syndrome are not clear, although it is probably safe to assume that any hereditary influence was ruled out by the exhaustive clinical and experimental investigations of Viscus and Vomer in 1926, with which, no doubt, you are perfectly familiar."

"Er—yes," said our friend, "I believe I do remember. Well, no doubt they knew what they were talking about." And he changed the subject, we cannot imagine why.

We were disappointed, too, having had some suggestions to make. Certainly in no other profession, with the possible exception of the military, is there so strong a continuity of tradition. There must be a reason behind it. Flattering as it would be to assume that our sons follow us down the hospital corridor for the sake of our *beaux yeux*, it is pretty thin from any rational standpoint. There must be something beyond ourselves that attracts them.

The uniform? Well, the uniform is a good one. It is white, a hopeful color and usually welcome. It is never soiled except in the line of duty, and its constant renewal has a wholesome effect.

The power? Well, yes, it is quite a thing to save life. It teaches a man humility, for one thing. He is never quite able to believe he has done it alone.

The prestige? Undoubtedly there is prestige to be had, and not of the common or garden variety, either. Prestige with the world is shallow in comparison. When a man's work is of a kind to give him even occasional standing *with himself*, he has confronted the hardest court of appeals on earth and has come away without a stain on his honor.

Whatever the ultimate meaning of life may be, the physician or surgeon is neighbor to the Source. Perhaps it is this that brings his sons to his side. Youth is, of all things else, an era of perception. We smile good-naturedly at its so-called follies, but none of us have memories so poor that we cannot recall our youthful aspirations, so pathetically mingled with uncertainty and frustration. We remember too well the embarrassment that kept us tongue-tied about what we felt most profoundly, and the anguish of feeling that nobody understood us or believed in our powers. Yet there was dignity in us, and we knew it. We remember how we longed for solid ground under our feet, for challenging work to try us and prove our mettle. We were altruists, too—not practical, but how earnest! If willingness could have done it, we would have saved the world twice a week.

Now for young persons of this constitution—and there are plenty of them in any age of the world, including this one—the medical profession offers almost a magic grouping of satisfactions to meet these desires, and for the most part it fulfills the promise. Backbreaking work and heartbreaking disillusionment are involved, but this is a universal and not a peculiar experience. The "virus" of which our friend spoke is unique among viruses, being wholly benign. The affection it generates, though in most cases incurable, confers immunity to certain more dangerous plagues. Barring complications (the commonest of which, perhaps, are acute inflammation of the ego and persistent myopia with regard to the achievements of others), we may venture to say the prognosis is excellent.

Chapter News

International College of Surgeons

United States Chapter

Arnold S. Jackson, M.D., F.A.C.S., F.I.C.S., Secretary

Annual Assembly: Plans for the Annual Assembly, to be held September 10, 11, 12 and 13 at the Palmer House, Chicago, are now nearly complete, and indications are that last year's record attendance will be exceeded. All members of the College who have not yet made reservations are urged to do so at once to avoid disappointment. This is especially true of banquet reservations, as seating capacity is limited to 1,100. Dr. Chester W. Trowbridge, who has so capably handled the banquet arrangements in the past, will again act as chairman.

The programs will run from Monday morning, September 10, through Thursday afternoon, September 13. There will be several innovations in the way of sectional meetings. The newly-formed Section on Obstetrics and Gynecology will hold its first meeting on Wednesday morning, and a joint meeting with the Urological Section is contemplated in the afternoon. Dr. Gilbert F. Douglas of Birmingham is Chairman of the Obstetrics and Gynecology Section. Drs. M. Leopold Brodny, Boston, and C. K. Church, New York, are arranging the program for the Urological Section, which lists several of the leading urologists in the country.

Dr. Edward L. Compere, Professor of Orthopedics at Northwestern Medical School, is acting as Chairman of the Section on Orthopedics and, with Dr. Carlo Scuderi, Secretary, is arranging an interesting program for those in this field.

The newly created Section on Occupational Surgery will hold a half-day program under the direction of Dr. Chester C. Guy of Chicago. Another newly formed group, the Section on Plastic Surgery, will also have a program for the Chicago meeting. The Eye, Ear, Nose and Throat Section is preparing a well balanced program, and they have obtained several noted authorities in this field.

The General Assembly program has been planned to follow along the general lines of the Atlantic City and Cleveland Assemblies, with special emphasis on practical phases of surgery. Papers will be presented by leading authorities of Canada and the United States on subjects of interest and value to the general surgeon, by men who have attained success in their particular specialty. There will be no "repeaters" from last year's program. This assures the audience of the opportunity to hear new speakers but on new, stimulating subjects. Most speakers are allowed twenty minutes, and each will be limited to his alloted time. Three outstanding English-speaking foreign guests will be invited to participate. Dr. Max Thorek will make the selections.

Those particularly interested in surgical research will have an opportunity to attend a two-hour program presented by young surgeons working in these fields under the direction of Dr. Karl A. Meyer, Professor of Surgery at Cook County Post Graduate School of Medicine.

A partial list of speakers follows:

Monday morning: A Symposium on colon surgery with a basic science review of the anatomy, pathology, roentgenology and an internist's view of the important diagnostic criteria, will be given by Drs. Sidney A. Portis, Jacob Glassman, Hans Popper, James T. Case, Raymond W. McNealy, Peter A. Rosi and Francis D. Wolfe, all of Chicago.

Monday afternoon: Drs. Leo J. Starry, Oklahoma City; Frank R. Peterson, Cedar Rapids; Harry E. Bacon, Philadelphia; Martin Nordland, Minneapolis; Charles S. White, Washington, D. C.; Douglas U. McGregor, Hamilton, Canada; and Fred R. Harper, Denver, will speak on general surgical subjects.

Monday evening: Canadian members will meet for a business meeting and dinner at 5:30. At 8 a scientific motion picture program, under the direction of Dr. Philip Thorek, will be a special feature, with the author of each film present for discussion.

Tuesday morning: Among the speakers on a panel discussion on acute surgical diseases of the abdomen are Dr. Charles W. Burns, Professor of Surgery at Winnipeg; Dr. Ralph R. Coffey, Kansas City, and four prominent Chicago surgeons. Following this is a symposium on cardiovascular surgery, with papers presented by Drs. E. G. Fell, Chicago; Willis

J Potts, Chicago, Felix L Pearl, San Francisco, and Saul S Samuels, New York

Tuesday afternoon Speaking on general surgical subjects are Drs Stanley Maxeiner, Minneapolis, Russell M Kurten, Racine, Wisconsin, Amos R Koontz, Baltimore, Alfred W Adson, Rochester, Minnesota, Samuel F Marshall, Boston, and Charles T Dotter, New York

Tuesday evening Ten minute papers of interest to the general surgeon will be given by speakers from the Urological Section and from the Section on Obstetrics and Gynecology

Wednesday morning A symposium on acute intestinal obstruction, presided over by Dr George Curtis, features Drs Willis D Gatch, Indianapolis, Ira H Lockwood, Kansas City, Claude J Hunt, Kansas City, and Franklin I Harris, San Francisco Following the symposium is a panel discussion on the same subject, at which the participants with Dr Herbert Acuff acting as moderator, are Drs Philip Thorek, Chicago, Guy V Pontius, Chicago and Thomas B Noble Jr Indianapolis

Wednesday afternoon Papers will be presented by Drs Lyon H Appleby, Vancouver, William J Thompson, St Louis, Dewey J Bisgard, Omaha, Everett Coleman, Canton, Illinois, Roland Klemme, St Louis, and Willard Bartlett, also of St Louis

Wednesday evening The Annual Banquet will be held at the Palmer House, with Dr Max Thorek acting as toastmaster The featured speaker will be announced later

Thursday morning Speakers on this program are Drs J W McRoberts, Sheboygan, Wisconsin, Luther E Holmgren, Madison, Wisconsin, Louis P Good, Texarkana, Harvey S Allen, Chicago, and two Junior College members, Drs William B Hobbins and Hyman S Lans, both of the Cook County Post Graduate School

Thursday afternoon Participating in this session are Drs Henry W Meyerding, Rochester, Minnesota, Curtis Lee Hall, Washington, D C, George J Garceau, Indianapolis, Phil C Kline, Temple, Texas, Charles W Mayo, Rochester, Minnesota, and three foreign guest speakers

Thursday evening The Convocation of the College will be held on this evening, with Dr Harry A Oberhelman acting as general chairman Members of his committee are Drs Ernest Purcell, Francis D Wolfe, C M Carey, and Clement L Martin The program, as well as directions for the candidates, will be mailed in advance, and newly elected members will attend the Thursday afternoon scientific sessions Convocation rehearsal will be held from 4 30 to 5 50 p m, Thursday

Junior College: All members of the College are reminded to encourage eligible resident surgeons to seek membership in the Junior College It is hoped that the placement of two Junior College members previously mentioned on this year's program will encourage others to write papers and assist themselves in the preparation for Associate memberships in the Senior College

Scientific Exhibits A new attraction at the Chicago Annual Assembly will be the addition of scientific exhibits

There will be no television program of surgical operations at this year's meeting

Regional Meeting in Indianapolis. A highly successful regional meeting was held at Indianapolis on April 9, in the auditorium of the Indiana University Medical School Approximately 200 surgeons from Indiana, Illinois and Michigan were in attendance

Dr Thomas B Noble Jr acted as chairman of the meeting and was assisted by the Indiana Regent, Dr George J Garceau, and several committee chairmen

After the all day scientific program, dinner was served at the Columbia Club, followed by addresses by Dr Max Thorek and Dr Henry W Meyerding, the Hon Henry S Schricker, Governor of Indiana, and the Hon Phillip L Bayt, Mayor of the City of Indianapolis, gave addresses of welcome to the group

Following is the scientific program

W P Moenning, M D, Indianapolis, *Sterility*

L C Roettig, M D, Columbus, Ohio, *Chemical Debridement of Wounds*

J H Strickler, M D, Minneapolis, *Nonoperative Treatment of Common Duct Stones*

U G Dailey, M D, Chicago, *Vagotomy and Phrenic Nerve Crush*

J A Bargen, M D, Mayo Clinic *Surgical Indications in Various Forms of Ulcerative Colitis*

L W Freeman, M D, Indianapolis, *Spinal Cord Regeneration*

C S Beck, M D, Cleveland, *Operations for Coronary Disease*

A S Jackson, M D, Madison, Wis, *Modern Concepts of Thyrotoxicosis*

Chapter News

International College of Surgeons

United States Chapter

Arnold S. Jackson, M.D., F.A.C.S., F.I.C.S., Secretary

Annual Assembly: Plans for the Annual Assembly, to be held September 10, 11, 12 and 13 at the Palmer House, Chicago, are now nearly complete, and indications are that last year's record attendance will be exceeded. All members of the College who have not yet made reservations are urged to do so at once to avoid disappointment. This is especially true of banquet reservations, as seating capacity is limited to 1,100. Dr. Chester W. Trowbridge, who has so capably handled the banquet arrangements in the past, will again act as chairman.

The programs will run from Monday morning, September 10, through Thursday afternoon, September 13. There will be several innovations in the way of sectional meetings. The newly-formed Section on Obstetrics and Gynecology will hold its first meeting on Wednesday morning, and a joint meeting with the Urological Section is contemplated in the afternoon. Dr. Gilbert F. Douglas of Birmingham is Chairman of the Obstetrics and Gynecology Section. Drs. M. Leopold Brodny, Boston, and C. K. Church, New York, are arranging the program for the Urological Section, which lists several of the leading urologists in the country.

Dr. Edward L. Compere, Professor of Orthopedics at Northwestern Medical School, is acting as Chairman of the Section on Orthopedics and, with Dr. Carlo Scuderi, Secretary, is arranging an interesting program for those in this field.

The newly created Section on Occupational Surgery will hold a half-day program under the direction of Dr. Chester C. Guy of Chicago. Another newly formed group, the Section on Plastic Surgery, will also have a program for the Chicago meeting. The Eye, Ear, Nose and Throat Section is preparing a well balanced program, and they have obtained several noted authorities in this field.

The General Assembly program has been planned to follow along the general lines of the Atlantic City and Cleveland Assemblies, with special emphasis on practical phases of surgery. Papers will be presented by leading authorities of Canada and the United States on subjects of interest and value to the general surgeon, by men who have attained success in their particular specialty. There will be no "repeaters" from last year's program. This assures the audience of the opportunity to hear new speakers but on new, stimulating subjects. Most speakers are allowed twenty minutes, and each will be limited to his alloted time. Three outstanding English-speaking foreign guests will be invited to participate. Dr. Max Thorek will make the selections.

Those particularly interested in surgical research will have an opportunity to attend a two-hour program presented by young surgeons working in these fields under the direction of Dr. Karl A. Meyer, Professor of Surgery at Cook County Post Graduate School of Medicine.

A partial list of speakers follows:

Monday morning: A Symposium on colon surgery with a basic science review of the anatomy, pathology, roentgenology and an internist's view of the important diagnostic criteria, will be given by Drs. Sidney A. Portis, Jacob Glassman, Hans Popper, James T. Case, Raymond W. McNealy, Peter A. Rosi and Francis D. Wolfe, all of Chicago.

Monday afternoon: Drs. Leo J. Starry, Oklahoma City; Frank R. Peterson, Cedar Rapids; Harry E. Bacon, Philadelphia; Martin Nordland, Minneapolis; Charles S. White, Washington, D. C.; Douglas U. McGregor, Hamilton, Canada; and Fred R. Harper, Denver, will speak on general surgical subjects.

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General News Notes

Dr. Goldstein Honored: On June 11, 1950, the New Jersey Gastroenterological Society presented a testimonial award to Dr Hyman Isaac Goldstein for "distinguished contributions to medical science, particularly in the fields of gastroenterology and medical history"

Dr Goldstein read his first medical paper before the Camden County Medical Society in 1911 and since that time has had over one hundred and fifty articles published, notably upon gastroenterologic, cardiologic, hematologic and medicohistorical subjects

He was born in 1887 in Baltimore, Maryland, and was graduated in 1909 from the University of Pennsylvania where he studied medicine under a scholarship He did postgraduate study at the University of Vienna Since the completion of his education, over a period of forty-two years, he has been practicing medicine in Camden, New Jersey He received a state license as health officer of New Jersey in 1913 and as sanitary inspector, first class, of New Jersey in 1916 He was consulting physician at the Deborah Sanatorium in Brown Mills, New Jersey, attending physician at the Mount Sinai Hospital and associate visiting physician at Philadelphia General and Northwestern General Hospitals in Philadelphia

Dr Goldstein has lectured on many occasions at American and European medical congresses, conventions and colleges He was a member of the International Medical Congresses for the years 1931, 1932, 1935 and 1937 In 1937 he was selected as a delegate to present a symposium on liver diseases and their relation to the nervous system at the International Congress in Vichy, France In recognition of his medical accomplishments he has been elected to various honorary positions and to honorary memberships in medical societies Dr Goldstein is an honorary member of the National French Society of Gastroenterology in Paris, the Italian Society of Gastroenterology in Rome and the Belgian Society of Gastroenterology in Brussels and is a corresponding member of the Hungarian Dermatological Association in Budapest, the Cuban Society of Cancerology in Havana and the Cuban Society of Dermatology and Syphilography in Havana He is a life member of the American Medical Association of Vienna and a member of the Union Therapeutique of Paris Dr Goldstein is also a member of the following American medical societies the American Medical Association, the International Society of Internal Medicine, the International Society of Gastroenterology, the American Heart Association, the American Association for Advancement of Science, the American Trudeau Society, the Camden County Medical Society, the Medical Society of New Jersey (past secretary and past chairman of the Section on Gastroenterology and Proctology), the New Jersey Heart Association, the New Jersey Gastroenterological Society (past president and a founder), the Northern Medical Association of Philadelphia (past president) and the Medical Club of Philadelphia

The Journal of the International College of Surgeons extends its congratulations to Dr Goldstein for his recent award by the New Jersey Gastroenterological Society and for the completion of forty rich years of productive work in the field of medicine

International Society of Orthopaedic and Traumatic Surgery: This society will hold its fifth congress in Stockholm, Sweden, from May 21 to 25, 1951 The subjects principally to be discussed are "Avitaminosis and Bone Changes" and 'Low Back Pain and Sciatica" A number of miscellaneous papers of common interest will also be presented The secretary of the Congress is Dr Anders Karlen, Karolinska Institutets Ortopediska Klinic, Stockholm

Mass Radiographic Study in Eire: The Department of Health in Eire has created a limited nonprofit company known as the National Radiography Association The purpose of the organization is to provide miniature mass radiographic mobile units which will operate throughout Eire in cooperation with local civic health authorities The service is modeled on that operating in Sweden Mass radiographic procedures are being conducted in Dublin and in County Cork

Ambulatory Fracture Association: This organization announces the election of the following new officers President, Roger A Vargas, M D, 1181 N Mt Vernon Avenue, Philip Thorek, M. D., Chicago, *Recent Trends in Oesophageal Surgery.*

John Sullivan, M. D., New York, *Hernia.*

Herbert Acuff, M. D., Knoxville, Tenn., *Transthoracic Approach to Upper Abdominal Problems.*

New England Regional Meeting: This meeting was held in Boston on March 28 and was well attended. Dr. M. Leopold Brodny of Boston was the chairman of the one-day scientific session. The meeting was concluded with a banquet in the evening.

Following is the scientific program:

James A. Lamphier, M. D., Boston, *Recent Progress in Gynecology and Obstetrics.*

Gordon M. Morrison, M. D., Boston, *Some Aspects of Modern Bone and Joint Surgery.*

Malvin F. White, M. D., Boston, *The Role of Plastic Surgery in the Treatment of Malignant and Benign Skin Lesions.*

M. Leopold Brodny, M. D., Boston, *Criteria for the Four Types of Prostatectomy.*

Philip Thorek, M. D., Chicago, *Modern Concept on Surgery of the Esophagus.*

Alexander J. A. Campbell, M. D., Boston, *Indications for Surgery in Peptic Ulcers.*

Plastic Surgery Section: The officers for the newly organized Plastic Surgery Section of the United States Chapter of the International College of Surgeons are as follows:

Chairman: Neal Owens, M.D., New Orleans.
Vice-Chairman: C. R. Straatsma, M.D., New York.
Secretary: William Milton Adams, M.D., Memphis.
Assistant Secretary: Leon E. Sutton, M.D., Syracuse, N. Y.

The Credentials Committee consists of the following members:

George W. Pierce, M.D., San Francisco, California.
Lyndon A. Peer, M.D., Newark, N. J.
Edward A. Kitlowski, M.D., Pittsburgh, Pa.
Kenneth L. Pickrell, M.D., Durham, N. C.
Robert E. Moran, M.D., Washington, D. C.

Dr. Halligan Honored: Dr. Earl J. Halligan, F.A.C.S., F.I.C.S., Regent of the State of New Jersey, has been appointed Surgeon-in-Chief and Director of Surgery of the Jersey City Medical Center.

Dr. Brailsford To Conduct Lecture Course: Dr. James S. Brailsford, F.I.C.S., upon whom the title "Emeritus Director of Radiological Studies in the Living Anatomy," at Birmingham University, will lecture daily on bone and joint roentgenology for one week at the Royal Orthopaedic Hospital of Birmingham, England. The lecture course extends from July 1 to 7 inclusive. All members of the College are cordially invited to attend. The lectures will proceed as follows:

Monday.—1. Congenital deformities of bone and joints; extent, distribution and character. Influence of heredity and environment on development.

2. Bone and Joint Dysplasias and Dystrophies; hereditary and other factors of influence; types of deformity produced; secondary developments.

Tuesday.—Deficiency, endocrine and hematologic diseases; familial influence; secondary changes.

Wednesday. — Conditions producing osteoporosis; conditions producing increased density of bone.

Thursday.—Injuries of bones and joints; immediate and latent roentgen changes; later secondary changes.

Friday. — Inflammatory diseases of bones and joints; latent periods.

Saturday.—Benign and malignant tumors of bone.

The mornings will be spent in lectures and film reading sessions; the afternoons in demonstrations of cases under treatment, and the evenings to sightseeing in Stratford, Warwick, Ludlow, etc.

Dr. Manzanilla Reelected: Prof. Dr. Manuel A. Manzanilla, F.I.C.S., of Mexico, Faculty Member of the School of Medicine of the National University of Mexico and International Vice-President of the International College of Surgeons, has been reelected Vice-President of the National Academy of Science of Mexico.

Turkish Chapter: The Turkish Chapter has announced that its second meeting this year will be held in Istanbul on May 12, 1951. All members of the College are cordially invited to attend. Complete information may be obtained from the Secretary of the Chapter, Prof. Dr. Dervis Manizade, Professor of Surgery, University of Istanbul.

New Books

A Textbook of X-Ray Diagnosis. By British authors, edited by S Cochrane Shanks and Peter Kerley Philadelphia and London W B Saunders Company, 195 2d ed, vol 2 Pp 702, with 605 illustrations

This massive work, the second of four volumes, deals with roentgen diagnosis of thoracic disease As would be expected, the majority of the 605 illustrations are roentgenograms of the chest

Seventeen prominent British authorities, *including the two editors, have contributed* to this volume Publication has been de*layed by the exigencies of war's aftermath* in Britain, but the final result is well worth waiting for The first edition appeared ten years ago, and it goes without saying that much material of value can be presented now which was not then available A special effort has been made to bring the entire *work up to date in every possible way*

There are only two formal divisions in Volume 2, which, of course, means, that each one is a book in itself The first is devoted to the cardiovascular system as related to the organs, tissues and structures of the thorax, the second, to the respiratory system and diseases referable thereto

A compendium of this kind, the work of a number of authors in succession, is always of interest to the thoughtful reader In this instance the interest is even greater *than usual, not only because of the recent* technical advances included but because, despite the great length of the book, not a word is wasted Every surgeon and every roentgenologist will find it a worth-while addition to his library shelves and a dependable aid in his practice

Pedicle Flaps in Plastic Surgery. By Gordon B New and John B Erich Springfield, Ill Charles C Thomas, Publisher, 1950 Pp 104, with 76 illustrations (A monograph in the series **American Lectures in Surgery.**)

In this concise work the authors have covered their subject thoroughly within surprisingly small compass In their introduction they point out that this field of surgery is highly complex and that the confusion is increased by the widely different opinions and technics of different surgeons They emphasize, therefore, the fact that they have no intention of trying to present "unalterable" technics Their purpose is to offer the reader what has been learned thus far from *experience at the Mayo Clinic with regard* to the use of pedicle flaps for reconstructive operations, particularly about the head and neck

The book opens with a brief discussion of pedicle flaps in general Particular operations are taken up in detail later There is an excellent chapter, abundantly illustrated, on simple and tubed pedicle flaps Single and double flaps and their use are explained, as are the factors of elevation, delay and transplantation The remainder of the book is given over to injuries or deformities of the head and neck and their treatment by the pedicle flap technic

The work is not only adequately but admirably illustrated, and its brevity and pithiness make it decidedly valuable

Diseases of the Stomach, Oesophagus and Duodenum. By Pierre Hillemand Paris *Editions Medicales Flammarion,* 1950 Pp 894, with 323 double illustrations

This is a complete, instructive, and up-to date discussion of diseases of the organs mentioned in the title These diseases are analyzed from the pathologic, etiologic, clinical and therapeutic viewpoints

First, the congenital malformations are reviewed This is followed by a study of inflammatory, neoplastic, nervous and vascular conditions of the esophagus, stomach and duodenum

In the chapters devoted to the esophagus are included, among other subjects, the etiology, pathology, symptoms, evolution, complications, diagnosis, and treatment of carcinomas and sarcomas of this organ

The section on the stomach presents specific cases illustrating the author's recom*mendations* After presenting the indications for and the medical treatment of gastric and duodenal ulcers, the advice is given that surgical treatment should be instituted for (1) all ulcers *presenting a suggestion* of malignancy, (2) all ulcers associated with abundant or repeated hemorrhage, (3) ulcers progressing toward stenosis, and (4) ulcers resisting medical treatment

Chapters are devoted to the treatment of

San Bernardino, California; First Vice-President, F. Wayne Brewster, M.D., 414-16 East Avenue, Holdrege, Nebraska; Second Vice-President, C. Philip Fox, M.D., 305 People's Bank Building, Washington, Indiana; Secretary-Treasurer, H. W. Wellmerling, M.D., 626 Griesheim Building, Bloomington, Illinois. The Board of Governors consists of the following members: Custis Lee Hall, M.D., 1801—I Street, N.W., Washington, D. C.; Alfred E. Gallant, M.D., 727 W. Seventh Street, Los Angeles, California; Irvin H. Scott, M.D., Scott Medical Bldg., Sullivan, Indiana; Ivan N. Boyer, M.D., Colwell-Arnold Bldg., Kittanning, Pa.; Nathan E. Bear, M.D., Monroe Clinic, Monroe, Wisconsin; Homer D. Junkin, M.D., The Paris Hospital, Paris, Illinois; Ralph E. Mueller, M.D., 600 Professional Bldg., Kansas City, Missouri, and James A. Valentine, M.D., 2158 S. Ashland Avenue, Chicago, Illinois.

Brazilian Society on Sterility: The following officers of the Brazilian Society on Sterility were elected for 1951-52, at a meeting held on January 23, 1951: President, A. Campos da Paz Filho; Vice-Presidents, Claudio Goulart de Andrade, Victor Rodrigues, Alvaro de Aquino Salles; General Secretary, H. França de Faria; Secretaries, Armindo de Oliveira Sarmento, Henrique Duék, Afrânio B. Matos; Speaker, Jorge de Rezende; Treasurer, Carlos de Menezes Campos; Librarian, Alipio Augusto; Editors for Publications, Ruy Goyanna e Jorio Salgado; Director of Museum, Osmar Texeira Costa; Committee on Gynecology, Arnaldo de Moraes (Chairman), Clarice do Amaral, Paulo Barros; Committee on Obstetrics, O. Rodrigues Lima (Chairman), Guilherme Serrano, Waldyr Tostes; Committee on Urology, Guerreioro de Faria (Chairman), Alberto Gentile, Adib Antonio Couri; Committee on Endocrinology, José Schermann (Chairman), B. Albagli, José Procopio do Valle; Committee on Roentgenology, Nicola C. Caminha (Chairman), Carlos Osborne, Bruno Lobo; Committee on Pathology, Amadeu Fialho (Chairman), José Bica, Ernani T. Torres; Committee on Laboratories, Nelson Castro Barbosa (Chairman), Saúl Carneiro, Dib Gebara; Committee on Urology, Guerreiro de Faria (Chairman), Séve Neto, Nuno Lisbôa; Committee on Admissions, Clovis Corrêa da Costa (Chairman), Octacilio Gualberto. Jorge Rodrigues Lima.

International Congress of Military Medicine and Pharmacy: This Congress will convene in Paris June 17 to 23 under the patronage of the President of the French Republic. The chairman will be Inspecting Physician General Jame. The Congress is open to all physicians, pharmacists, veterinarians and officers of the administrative services. The program deals with worldwide health problems. For information address General du Congres, Section Technique du Service de Santa, 8 bis des Recollets, Paris 10, France.

Thirteenth British Congress of Obstetrics and Gynaecology: This Congress is scheduled to be held at Leeds, Yorkshire, July 8 to 11, 1952. Abnormal uterine action in labor, stress incontinence of urine, the pediatrician in a maternity unit, and female genital tuberculosis are listed as subjects for discussion.

Plastic Surgery Awards, 1951: The Foundation of the American Society of Plastic and Reconstructive Surgery offers Junior and Senior Awards for original contributions in Plastic Surgery.

Junior Award: Two scholarships in Plastic Surgery of 6 and 3 months respectively.

The contest is open to plastic surgeons in the specialty not longer than five years.

Senior Award: For the best essay on "Mass Treatment of Burns in Atomic Warfare."

The winning essays will appear on the program of the forthcoming annual meeting of the American Society of Plastic and Reconstructive Surgery to be held at Colorado Springs, Colorado, Oct. 31-Nov. 2, 1951.

All entries must be received by the Chairman not later than August 15, 1951.

For full particulars write to the Award Committee, c/o Jacques W. Maliniac, M.D., 11 East 68th Street, New York 21, N. Y.

Mr. Zimmer Deceased: It is with deepest regret that we record the recent death of Mr. J. O. Zimmer, President and Founder of Zimmer Manufacturing Company, Warsaw, Indiana. Mr. Zimmer, a pioneer in his field, organized the company in 1927 and has been president continuously since that date. Under his leadership the firm has worked closely with leading surgeons and hospitals to develop equipment needed for new technics and procedures. He was held in high esteem by the profession.

Diabetes Mellitus. By Garfield G Duncan Philadelphia W B Saunders Company, 1951 Pp 289, with 32 illustrations

The author, writing in collaboration with three professional colleagues (Drs Ferdinand Fetter, Perry S MacNeal and Barkley Beidleman) and the Director of the Food Clinic at Pennsylvania Hospital (Martha A Hunscher) has undertaken to provide physicians and students with "a practical and simplified outline of therapy" for diabetes mellitus, at the same time offering a correlation of long-standing and recently acquired knowledge of this disease The purpose is well accomplished in this convenient volume

The nature, history, incidence, etiology and prognosis of diabetes are discussed, and a chapter is given over to the use of various forms of insulin in its treatment In the sections dealing with the physiologic and pathologic changes associated with the condition, the discussion is particularly comprehensive and usable Following these are thoroughgoing chapters on symptoms, physical signs, diagnostic points food requirements, therapy and complications, the last mentioned including pregnancy An entire chapter is devoted to the diabetic child and the special requirements applicable to such a patient In short it would be hard to imagine a fuller treatment in so compact a volume In addition to the illustrations, there are many tables of immediate reference value

Primer on Fractures Prepared by the Special Exhibit Committee on Fractures in Cooperation with the Committee on Scientific Exhibit of the American Medical Association New York Paul B Hoeber, Inc, 1951 6th ed Pp 109

This small volume is packed full of facts concerning the treatment of the more common types of fracture Naturally, in such a limited space one cannot expect to find detailed discussions, but the important features of the standard methods of therapy are described in clear, concise fashion

In addition, there are brief discussions of emergency first aid, application of casts, and physical therapy Also included are check lists of splints and accessories for the doctor's office and for his automobile

A basic text of this kind is of great value to the practitioner who sees and treats only an occasional fracture It may also be very useful to the advanced medical student in acquainting him with the essential elements of fracture therapy

A Study in Slipped Upper Femoral Epiphysis By Torsten Jerre Copenhagen Ejnar Munksgaard, 1950 Pp 157

This excellent monograph reflects an exhaustive amount of work by the author His objective was twofold, to determine the late functional and roentgenologic results, and to discuss the value of closed reduction

He has collected a total of 166 patients (200 hips) of whom 83 per cent were male On the basis of roentgenograms taken during adolescence 38 of the patients showed bilateral involvement However, the long term follow-up brought out the interesting fact that 30 additional patients showed roentgen changes on the "healthy" side Aseptic necrosis appeared in 20 cases (in only 8 cases was open reduction employed) The incidence of aseptic necrosis was definitely higher in those cases in which closed reduction produced an improvement in position of the capital epiphysis

The late reexamination of these cases (153 patients, 183 hips) provides some interesting and valuable information The time between original treatment and reexamination varied from three to thirty years, the average being fifteen and one-half years As one would expect, the extent of epiphyseal displacement has a pronounced influence on the late functional result There was slow but progressive deterioration of function with advancing age After aseptic capital necrosis and so-called necrosis of the joint cartilage the late results were very poor

The author's conclusions are of value with regard to closed treatment (only 8 of 200 hips were treated by open reduction) and they are rather discouraging Of the 24 hips in which closed reduction was successful, 10 progressed to aseptic necrosis (41 7 per cent Of the many in which closed reduction produced no change in position of the epiphysis aseptic necrosis occurred in only 7 5 per cent, but, because of malformation of the femoral head, the late functional results were poor

This extensive study illustrates clearly that in order to obtain a good functional result treatment must be instituted before more than minimal slipping has occurred gastric hemorrhage and gastric perforation as well as pyloric stenosis and stenosis of other types.

About one hundred pages are devoted to the study of inflammatory or toxic disorders of the stomach.

Benign tumors of the stomach and of the duodenum, adenomas, fibromas and lipomas, form instructive chapters also.

The physician will find in this work valuable information concerning gastritis, acute and chronic duodenitis, syphilis and tuberculosis of the stomach. The chapter on cancer of the stomach is detailed and its study will well repay the reader's interest.

A Study on Genital Tuberculosis in Women. By Henry Jedberg. Pp. 176. Lund, Sweden.

This monograph is a supplement to Volume 30, 1950, of **Acta Obstetricia et Gynecologica Scandinavica.** It contains an excellent and thorough review of the literature on genital tuberculosis in women and it also contains an analysis of 186 cases of surgically treated genital tuberculosis observed in a number of hospitals in different parts of Sweden from 1942 to 1945. This represents the second largest series in the literature. The following types of patients were investigated: 100 women in sanitoriums, suffering from active pulmonary tuberculosis, 102 women treated for renal tuberculosis, 155 women with abdominal tuberculosis, hysterograms from 1,783 examinations, cases of suspected or proved genital tuberculosis treated in the Malmo General Hospital and 24 cases of genital tuberculosis observed among 1,168 cases of sterility. This is an extensive study of a subject which is not fully appreciated by the average physician. Genital tuberculosis in women is far more common than is generally suspected. The disease usually remains silent for many years, and it is generally only a part of a tuberculous infection in the body. In Jedberg's series 56 per cent had a history of tuberculosis elsewhere, and in 36 per cent there were coexistent tuberculous lesions elsewhere in the body. It is important for all women who have been placed in sanitoriums for pulmonary tuberculosis to be examined for genital and renal tuberculosis, because in 8 per cent of the sanitorium cases in this series the patients had genital and renal tuberculosis.

A definite diagnosis of pelvic tuberculosis is difficult but can be made by examination of the uterine endometrium (obtained by biopsy), culture of menstrual blood and cervical mucos on Loewenstein's medium, and guinea pig inoculation and hysterosalpingography.

At present, treatment should be conservative (paraaminosalicylic acid and streptomycin). Surgical therapy should be reserved for women who do not respond to conservative treatment. Patients should receive preoperative and postoperative antibiotic therapy and also sanitorium care before and after operation.

This monograph is highly worth-while reading. It is well written and full of useful information.

Cancer As I See It. By Henry W. Abelmann. New York: Philosophical Library, Inc., 1951. Pp. 100.

Dr. Abelmann has here presented his observations of cancer, the result of extensive research, drawing conclusions which he applies to the disease as a whole. He begins his inquiry by discussing the difficulties that may arise through faulty definition of terms, so that conditions not generally recognized as cancer may be overlooked, although they are actually various aspects of this disease. At a later point in the discussion the terminology is simplified by a classification of the various types of cancer according to the structure and function of the body cells, since cancer is not a corrupting factor of itself but rather a form of deterioration within a given organ or tissue. In the author's opinion the bulk of the evidence is in support of his theory that cancer is due to a "definite parasite organism, namely, a mold fungus," a concept which allows for an ultimate common cause of the various effects produced by cancer as it causes changes in the structure and function of the cells. Factors reducing resistance to invasion of this parasite are believed by the author to be cellular irritants and heredity. Some comment is also made about the possibly infectious nature of cancer with respect to this parasite. Every feature of cancer is discussed in relation to a parasitic origin, exact knowledge of the cause being necessary, says the author, before successful preventive measures can be accomplished. A review of the work done by others on the basis of this same parasitic theory is presented.

and reached a maximum ten to twelve days after the operation It thus seems that the immobilized patient has a progressive slow*ing of the venous flow in both legs and arms* during the postoperative phase, and that in ambulant patients, venous flow rates show an acceleration just at that time when such patients are most vulnerable to the other factors which contribute to thrombus formation In the patients from whom pelvic masses were removed, it was *felt that the* reduction of the intraabdominal pressure had a greater influence on the rate of venous flow than did the postoperative ambulation

RAYMOND GREEN M D

Intra-Arterial Histamine in Treatment of Claudication and Rest Pain Mackey, W A, Brit Med J 2 1806 1950

Fourteen cases of arteriosclerosis obliterans have been treated by Mackey with weekly injections of 2 mg of histamine phosphate into the femoral artery at the groin The histamine is dissolved in 500 ml of physiologic solution of sodium chloride and administration customarily takes thirty to forty-five minutes Injections are continued at weekly intervals for a period of ten weeks

Theoretically this method would not be selective, in that it affects all the blood vessels, both deep and superficial the advantage, the author claims being that the sympatholytic drugs are essentially cutaneous dilators While lumbar sympathectomy frequently relieves rest pain, it does not often enough improve claudication This is because the arterioles of the skin are much more completely under the control of the sympathetic nervous system while those of the muscles respond mainly to the metabolites of muscular reaction

Nine patients showed satisfactory improvement with this form of treatment They averaged approximately five years younger than the 5 who showed no improvement or unsatisfactory results Most of the results are classified as "improved' chiefly on the subjective sensations of the patients, since there is little or no improvement in oscillometric and other commonly used objective methods of measuring circulation in the periphery of the vascular system None of the patients was appa*rently made worse by* this form of treatment, although in some of them the disease continued to progress either in the same limb or elsewhere in the circulation

MORRIS T FRIEDELL, M D

Potassium Loss in Experimental Intestinal Obstruction Schilling, J A, McCoord, A B, and Clausen, S W, Surg, Gynec and Obst 92 1, 1951

The authors have reviewed the literature and have described their methods in the production of intestinal obstruction at various levels in healthy mongrel dogs Sodium, potassium chlorides, and water balance studies were made at intervals before death and at *autopsy and were compared with material* obtained from jejunal fistulas made in normal animals Tissues obtained at autopsy were similarly examined Their conclusions are as follows

1 The acute loss of potassium was relatively small and did not exceed 4 per cent of the body total compared with the acute loss of sodium, which approximated 25 per cent in certain instances

2 There is an important and prompt interchange within the cell between sodium and potassium after administration of one of these cations

3 *Displaced potassium is promptly* excreted in the urine despite total body depletion

4 With a negative nitrogen balance there was no retention of potassium after its administration Retention of sodium always occurred with a delayed diuresis

5 The concentration of sodium and potassium in normal intestinal secretions remained remarkably constant during excess administration and depletion

6 Serum concentrations of sodium and potassium also remained quite constant, except terminally in some moribund animals when there was a lowering of sodium and a sharp rise of potassium levels

7 The sodium concentration is approximately equal to, and the potassium concentration several times greater than, their respective serum levels in abnormal fluids lost during intestinal obstruction

8 The varying levels of potassium concentration in abnormal fluids seemed to reflect the degree of strangulation and necrosis of the obstructed loops

9 Within the cell there was a tendency for greater depletion of sodium than of potassium

10 *Potassium* loss per se was not toxic under the experimental conditions mentioned but was intimately related to the relatively greater sodium and water loss and the corresponding intracellular and extracellular readjustments HOWARD S STERN, M D

Caudal Anaesthesia, Lumbar Peridural Anaesthesia and Bilateral Lumbar Sympathetic Block With Single Doses of Xylocaine in 231 Deliveries. Risholm, L., Acta Societatis Medicorum Upsaliensis 55:323, 1950.

This is a report of synthetically prepared xylocaine in 231 deliveries using caudal anesthesia, lumbar peridural anesthesia, and peridural lumbar sympathetic block by the single dose method.

Xylocaine was used because it has proved to be an effective local anesthetic, rapid in action, with good spreading tendency in the tissues and prolonged effect. As compared with procaine, xylocaine has a greater absolute toxcity, but its relative toxcity is less pronounced owing to stronger anesthetic effect and to its greater tendency to spread the tissues.

The advantages of conduction anesthesia and the physiologic character of labor pain are presented to aid in the understanding of the local technics.

A 2 per cent solution of xylocaine with adrenelin added varying between 1: 50,000 and 1: 20,000 was used in all cases.

The caudal anesthesia was used for 191 patients, with 20 ml. of xylocaine found as a suitable dose to give anesthesia to a T10 level. Of these, 138 patients were given one injection each, while 53 were given repeated injections in order to prolong the anesthesia. In 85 cases in which the duration of anesthesia was carefully noted, this varied between one hour and thirty minutes and five hours and thirty minutes. The arithmetical mean was three hours and twenty-eight minutes.

Lumbar peridural anesthesia and bilateral and lumbar sympathetic block were done in order to relieve pain only and attempt to avoid a delayed expulsion stage. Since there is a maximum anesthetic effect on a level with T11 and T12, the authors believe that the expulsion reflex is not inhibited. In the peridural method 4-10 ml. of xylocaine was injected between L1 and L2 and L3, with the patient sitting. The disadvantage of peridural and lumbar sympathetic blocks was that, as the fetal head descended, lower vaginal and peridural pain was present, necessitating general anesthesia for relief.

Xylocaine has proved suitable as an anesthetic in obstretrics and seems to prolong the period of anesthesia.

V. N. Balovich, M.D.

Effect of Posterative Bed Rest and Early Ambulation on the Rate of Venous Blood Flow. Wright, P. H., Osborn, S. B., and Edmonds, D. G., Lancet, Jan. 6, 1951, p. 22.

The problem of venous stasis in the limbs of patients during the postoperative period were studied. The methods generally used for measuring the rate of blood flow are not completely satisfactory, since the results are subject to personal errors and the patient's reaction, and also because the sites at which recognizable reactions can take place are few. With the use of radio-isotopes, however, the results are more precise, since the instant of first arrival of a radio-isotope introduced into a vein can be detected with objective precision at any proximal point in the vessel.

Radio-active Na24 was injected intravenously into the extremity (foot or hand). The time of the first arrival of the isotope at the proximal end of the limb was detected by a Geiger-Müller counter placed over the femoral triangle for the leg and the axilla for the arm. One hundred and seventeen patients were studied postoperatively and at weekly intervals during convalescence. They were grouped into those who were walking at the time of recording and into those who had remained uninterruptedly in bed since the operation. Also, since it had been shown that there was a retardation of venous flow in the legs, first apparent during the second trimester of pregnancy, it was thought comparable to the latter to study the effect of venous flow in the legs of patients with pelvic tumors which gave rise to masses larger than a sixteen-week pregnancy, and thus a third grouping was arrived at.

The mean rate of venous flow in the arms and legs of patients continuously confined to bed showed a progressive slowing until the fifteenth day. Thus there was a generalized venous slowing in the limbs, and presumably in the circulation as a whole. The mean rate of venous flow in the ambulatory group showed no such slowing. As a matter of fact, there was an increase in the rate-flow of which was more marked in the legs

Armamentarium

Peroral Estrogen: Parke, Davis and Co offers Menagen, an estrogen for oral administration Each soft gelatin capsule contains natural estrogenic factors equivalent to 10,000 international units of ketohydroxyestratriene

The compound produces all the physiologic effects of natural estrogenic hormone Menagen is tasteless and odorless Readily absorbed from the gastrointestinal tract Menagen induces rapid response, is free of side actions, and supplies the plus value of psychic "lift" less obvious with synthetic estrogen Physiologic action of each Menagen Capsule is at least equivalent to that of 0 5 mg diethylstilbestrol Menagen is said to be effective and economical in management of menopausal symptoms and other conditions amenable to estrogen therapy One or two capsules daily after meals usually suffices in menopausal cases The dose may be increased at the discretion of the physician Menagen is available in bottles of 100 and 1000 flame-colored capsules

Telephone Aid: An automatic telephone-answering machine, the electronic secretary is now available for professional use No longer need the doctor miss any telephone calls because he is busy or away on a call The Electronic Secretary answers automatically, takes a message and also tells the caller when the doctor will return or where he can be reached It is manufactured for and distributed by Electronic Secretary Distributors, Inc, of Milwaukee Wisconsin

The Electronic Secretary is easily installed, as it is not connected to the telephone The unit also serves as a handy dictation machine

One physician in Wisconsin reported receiving three to five appointments every week end after the office was closed Another had all his calls transferred to his home at night when the office was closed He remarked it brought about a happier patient response

Dia-Discs: The availability of Dia-Discs has just been announced by CSC Pharmaceuticals, a division of Commercial Solvents Corporation Dia-Discs are small diagnostic tablets containing measured amounts of antibiotics and are used for the purpose of determining the antibiotic to which an infectious organism is most sensitive

According to the distributors, Dia-Discs quickly tell the physician the most effective antibiotic to use and also give a good indication of the antibiotic sensitivity of the organism Thus they place antibiotic therapy on an accurate basis, a distinct advantage when organisms of obscure identity and sensitivity are encountered

Six different Dia-Discs are available, representing the six antibiotics in common use today Penicillin, Bacitracin, Streptomycin, Chloromycetin © (chloramphenicol, Parke, Davis and Co), Aureomycin, and Terramycin Two potencies of each antibiotic are supplied, thus assuring accuracy over the entire range of sensitivity

Dia-Discs are supplied in boxes of 24 each tablet individually sealed in pliofilm, and are available as a unit in a convenient box together with a "sensitivity chart" which enables the technician to interpret quickly the results of observation

The technic for using Dia-Discs is simple Up to six tablets may be placed on a previously streaked Petri plate, which is then incubated overnight The diameter of the inhibition zone surrounding each tablet gives accurate indication of qualitative and quantitative sensitivity For complete information, write to J Burnside Co, 1148 E Grand Street, Elizabeth, N J

Dipping Refractometer: The improved dipping refractometer by Bausch & Lomb Optical Company of Rochester, New York, is an immersion-type instrument that permits testing of transparent liquids with refractive indices between 1 32 and 1 54 An index accuracy of 3 5 units in the fifth decimal place may be obtained The instrument may be used for applications ranging from research analysis to industrial product control in distilling, brewing, milk processing, and general chemical testing It has potentialities also in the field of education

The new liquid-tight metal beaker is said to prevent seepage and rapid evaporation An extra long splash collar gives added protection against penetration of liquids into compensator and instrument. The enclosed scale, fully protected by tube enclosure, is graduated in 100 divisions, with every tenth division numbered A micrometer drum permits precise reading to tenths of scale units Six interchangeable prisms cover the index range from 1 32 to 1 54, with individual ranges overlapping for continuous reading

The Manubriosternal Joint in Rheumatoid Arthritis. Bogdan, A., and Clark, J., Brit. M. J., Dec. 16, 1950, p. 1361.

That the manubriosternal joint can be involved in rheumatoid arthritis is illustrated by 5 clinical cases. Rheumatoid arthritis commonly affects synovial joints, especially those at the periphery and where there is considerable mobility, whereas the manubriosternal joint is usually cartiliginous and has very limited movement.

In the 5 cases reported, the early stages presented pain, swelling and tenderness at the joint, and these may be the first manifestations of rheumatoid arthritis. The pain is aggravated by respiratory movements, coughing, sneezing, yawning and exertion. Soft tissue swelling may be present. Roentgenologic changes, when present, are best seen in lateral views, and show soft tissue swelling, irregularity and narrowing of the joint space, erosions of the articular surfaces, and irregular expansion of the articulating ends of the manubrium and sternum.

RAYMOND GREEN, M.D.

Acute Gaseous Cholecystitis. Gowdey, J. F., and Copeland, M. N. New Eng. J. Med. 242:647, 1950.

Acute gaseous cholecystitis is an uncommon preoperative finding and the authors were unable to find reports of more than 15 such cases, exclusive of the 1 case which they report from the Pittsfield General Hospital, Pittsfield, Massachusetts. The distended gallbladder, full of air and showing a fluid level, was noted during routine flat film and spot film examinations of the abdomen of a patient with rather typical acute suppurative cholecystitis. There are four illustrations of these appearances, showing the gas-filled gallbladder with a fluid level and absence of gas in the rest of the biliary tree. The cultures of gallbladder wall and contents gave positive results for gram-positive gas-forming bacilli, not specifically identified, and small numbers of a gram-negative bacillus. Recovery of the patient followed partial cholecystectomy and drainage performed on the fifth day of the disease. The condition is differentiated from similar air-shadows in the gallbladder seen after the occurrence of cholecysto-duodenal fistula or regurgitation of air through an incompetent sphincter of Oddi. Early operation is advised as the treatment of choice.

Indirect Air Cystoscopy. Ridley, J. H., South. M. J., February 1951, p. 114.

A method of cystoscopy is presented which utilizes the indirect lens instrument with air instead of water as a medium. The method is limited to examination of the female because of the knee-chest position required.

The author comments upon several apparent advantages of utilizing this technic. Less general equipment is required and contamination is thereby reduced. The technic produces less discomfort, which compensates for the position required.

It is stated that an undistorted view of the vesical mucosa is obtained which allows a more accurate appraisal of vesicovaginal fistulas and facilitates the diagnosis of Hunner's ulcer.

Topical applications and biopsies are readily performed. Preoperative ureteral catheterization is facilitated by this technic.

It is emphasized that this method is presented as an adjunct to other methods of cystoscopy and would find useful application in female urologic conditions.

JACK HYMAN, M.D.

Bladder Stones. Maurer, J. E., Lich, R., and Burdon, S. B., Am. J. Surg. 81:295, 1951.

The unpredictable morbidity and mortality of vesicolithotomy through a high cystotomy prompted the authors to utilize an extravesical retropubic approach.

The delayed closure of the high cystotomy wound was thought to be related to lack of immobility and poor vascularity. The vascular supply of the bladder and prostate was reviewed, and the vascularity of the vesical neck and prostatic capsule was apparent.

A retropubic approach using the technic of Millin was employed in 10 cases of vasical calculi. Prostatic adenomas, if present, were enucleated. The vesical neck could then be forcibly dilated and calculi easily removed. The usual closure with urethral catheter drainage was employed.

Morbidity was minimized; and there was no mortality. The hospital stay was shortened considerably.

The procedure is recommended for calculi of less than 2 inches (5 cm.) in diameter when no other vesical pathologic surgical condition exists.

JACK HYMAN, M.D.

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In Memoriam

WILLIAM L. WALLACE

M.D., F.I.C.S.

The State Department has reported that Dr. William L. Wallace, a Southern Baptist medical missionary, died February 10 in prison at Wuchow, Kwangsi province, the victim of Chinese Communist persecution. He was 42 years old.

Dr. Wallace was born in Knoxville, Tennessee, and received both his preliminary education and his medical degree from the University of Tennessee. He pursued postgraduate studies at the University of Pennsylvania Graduate School of Medicine and the Cook County Graduate School of Medicine. He served his hospital internship at the Knoxville General Hospital, Knoxville, Tennessee and for one year before going to China, Dr. Wallace was house surgeon there. From 1935 to the time of his death he served as surgeon and head of the surgical department at the Stout Memorial Hospital at Wuchow, Kwangsi, China, greatly respected and beloved for his unselfish work as a medical missionary.

Dr. Wallace was a member of the American Medical Association, the Chinese Medical Association, the Tennessee State Medical Association and the International College of Surgeons. The entire College deeply mourns the tragic, unnecessary and untimely loss of such a colleague.

ROY DONALDSON McCLURE

M.D., F.I.C.S. (HON.)

Dr. Roy McClure, prominent Detroit surgeon, died of a heart attack on March 31 at the age of 69. Since 1916 Dr. McClure had been chief surgeon of the Henry Ford Hospital, which he organized at the request of the late Henry Ford. Born in Bellbrook, Ohio, Dr. McClure was graduated in 1904 from Ohio State University, studied further at Johns Hopkins Medical School and completed his education at the University of Prague. Dr. McClure did educational work and served the Government in two World Wars. After World War II he developed, for use during operations, a warning device which records changes in the oxygen content of the blood. Dr. McClure was active in early experiments pertaining to blood vessel suture and transplantation of organs, and was one of the first to perform a blood transfusion by direct blood vessel suture between donor and patient. He helped perfect a standard treatment of burns. Under his direction many advances were made in thyroid and breast surgery. During his lifetime Dr. McClure performed almost 30,000 major operations, most of them at the Ford Hospital.

The officers and members of the International College of Surgeons extend their warmest sympathy to the bereaved family and friends.

WILLIAM GUY DORAN

M.D., F.A.C.S., F.I.C.S.

In November 1950 William Guy Doran of Jersey City, New Jersey, died at the age of 64. A graduate of the Cornell University Medical College, Dr. Doran completed his further studies at the Istituto Ortopedico Rizzoli in Bologna, Italy, and the R.A.M.C. Orthopaedic Hospital, Hollymore, Birmingham, England. His internship was served at St. Vincent's Hospital in New York City. As visiting orthopedist Dr. Doran was affiliated with the following hospitals: St. Vincent's Hospital in New York, the Medical Center in Jersey City, New Jersey, St. Mary's Hospital in Hoboken, New Jersey, and the United States Marine Hospital in Staten Island, New York. Dr. Doran's practice was devoted entirely to orthopedic surgery.

In addition to holding a fellowship in the International College of Surgeons, Dr. Doran was a member of the American Medical Association, the American College of Surgeons, the American Academy of Orthopaedic Surgery, the Society of Surgeons of New Jersey and the county and state medical societies of New York and New Jersey.

FOUNDED BY DR MAX THOREK

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Original Articles

Alcaptonuria

HENRY MILCH M D F A C S F I C S AND
ROBERT AUSTIN MILCH A B
NEW YORK

ALCAPTONURIA is an "inborn error of metabolism" associated with the presence of homogentisic acid in the urine and dependent upon the intermediary metabolism of the mono amino, mono carboxylic aromatic acids tyrosine and phenylalanine In the great majority of reported cases (less than 200 in all) the disorder is present from birth and persists throughout life In youth it is more inconvenient than harmful, and, except for mahogany colored chemiluminescent urine[1] the patient is essentially symptom-free With advance in age, however, a considerable number of alcaptonuric patients acquire the more serious consequences of ochronosis, which will be noted later

Though undisputed cases of alcaptonuria were reported as early as 1584 by Scribonius, 1609 by Schenck, 1649 by Lusitanius and 1823 by Marcet,[2] the first accurate description must be accredited to Boedeker[3] In 1859 this observer detected in the urine of a patient with glucosuria a second reducing substance which was not a sugar and which he designated as 'alkapton" (alkali + Kaptein = to seize alkali) in consequence of its strong affinity for alkaline substances

In 1886 Kirk[4] reported the discovery, in the urine of an alcaptonuric patient, of a new acid which darkened on contact with alkali and to which he gave the name uroleucic acid In 1887, Marshall[5] described a crystalline acid in alcaptonuric urine which possessed more powerful reducing properties than glucose and which he named glycosuric acid Both of these substances have since been considered impure mixtures of the substance first isolated by Wolkow and Bauman[6] in 1891 This substance, to which the empirical formula $C H_8O_4$ was ascribed, has since been given the name homogentisic acid and, as a consequence of the studies of Osborne[7] and Neubauer and Falta,[8] has been shown to be 2,5 dihydroxyphenylacetic acid, or hydroquinoneacetic acid

The appearance of this acid in the urine affords the easiest means of diagnosis of the disorder, since as far as is known the

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Submitted for publication April 26 1951

disturbance is restricted solely to the appearance of this one abnormal substance. Its presence in the blood, though only in small quantities, probably explains the subsequent development of the ochronosis and arthritis which are characteristic of the later stages of the affliction.

From a biochemical point of view, interest centers not so much upon the identification of homogentisic acid as on the explanation of its derivation from the two specific amino acids. The currently accepted view stems largely from investigations conducted in the early years of this century, especially by Wolkow and Bauman,[6] who demonstrated the origin of homogentisic acid from tyrosine; by Langstein and Falta,[9] who showed that phenylalanine also increased the excretion of this acid when administered to alcaptonuric patients; by Alberhalden, by Dakin and, particularly, by Neubauer, whose work merits special attention.

The hypothesis of Wolkow and Bauman that intestinal microbial action was responsible for the introduction of two hydroxyl radicals into the benzene ring of tyrosine and phenylalanine for their conversion into homogentisic acid was disproved by the classic experiments of Abderhalden, Bloch and Rona.[10] These investigators showed that the subcutaneous injection of the soluble dipeptide glycyl-l-tyrosine produced results similar to those noted upon administration of tyrosine to alcaptonuric patients. From this it was clear that the disorder was essentially metabolic and not putrefactive, and attention was accordingly turned to the catabolism of the two aromatic amino acids.

Most aromatic substances are not completely oxidized by the normal animal organism and are excreted, with their benzene rings intact, as glucuronates or sul-

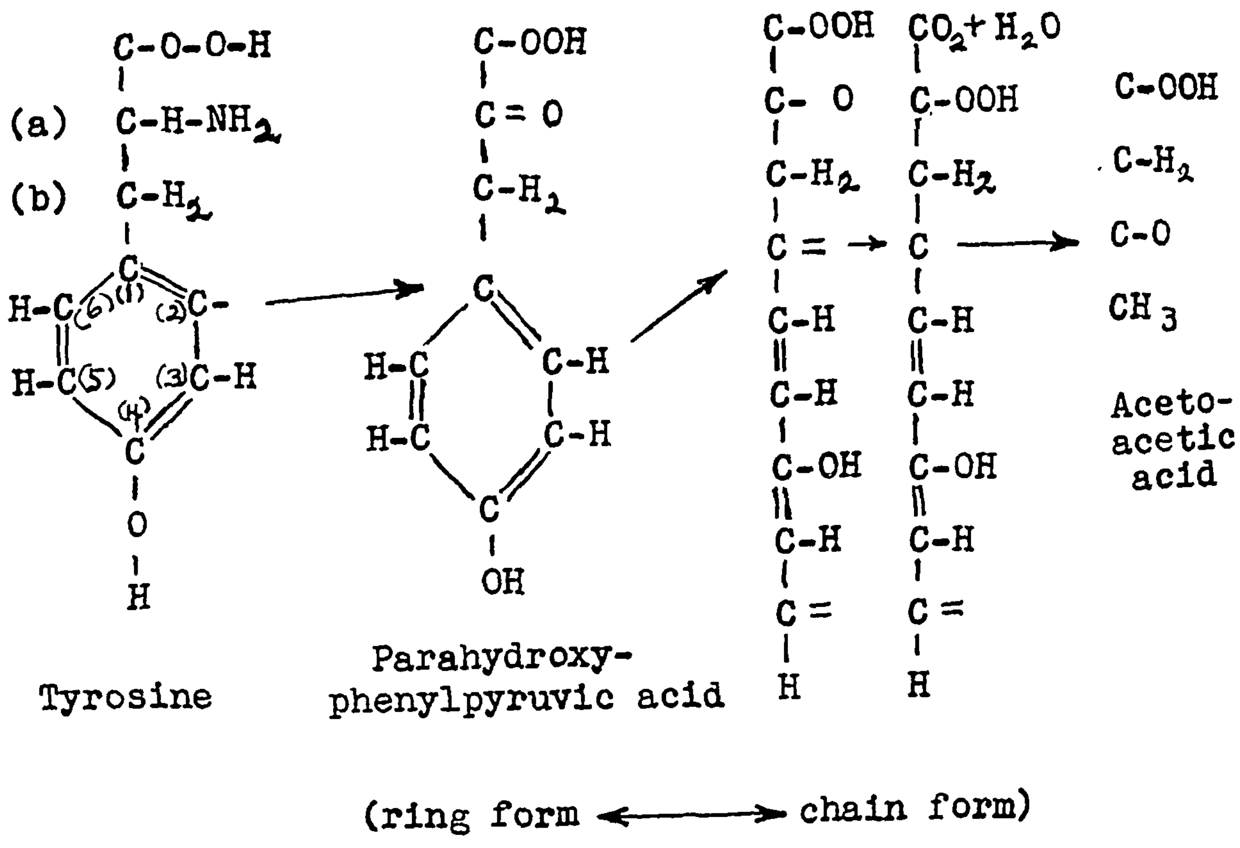
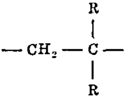


Chart 1.—Chemical analytical diagram of relations described in text (see P. 671).

fate esters or acids of the hippuric acid group. Phenylalanine and tyrosine differ in that they are readily and completely oxidized to acetoacetic acid by destruction of the benzene ring.

Though a definitive picture of acetoacetic acid formation is still lacking, the scheme postulated by Dakin and Wakeman[11] on the basis of perfusion through the surviving normal livers of experimental animals best fits the known facts. It appears that, on perfusion of the liver, only those aromatic amino and ketonic acids which possess the side chain



$$—CH_2—\overset{R}{\underset{R}{C}}—COOH$$

are capable of yielding acetoacetic acid. Those which have substituted groupings in the beta position, such as phenyl-beta-alanine (C_6H_5—CHNH$_2$—CH$_2$—COOH), or phenylserine (C_6H_5—CHOH—CHNH$_2$—COOH), are not so disrupted and do not yield acetoacetic acid.

The mechanism appears to involve opening of the benzene ring at the double bond between carbon atoms No. 1 and No. 2. The carbon atoms of the acetoacetic acid molecule are derived from the alpha and beta carbons of the original side chain and carbons 1 and 6 of the original ring, while the carbon of the original carboxyl group of the side chain appears as carbon dioxide. The remaining four carbon atoms (i.e., Nos. 2, 3, 4, and 5) of the original ring probably form another molecule of acetoacetic acid. This may be seen in the accompanying diagram (Chart 1).

Explanation of the conversion of tyrosine into para-hydroxyphenylpyruvic acid is based, by analogy, upon the previous experiments indicating that in the catabolization of phenyl-alpha-aminoacetic and phenyl-alpha-aminobutryic acid the corresponding alpha-ketonic acids were the first products to appear. (This oxidation may involve the intermediary formation of a hydrated imino acid or of a glyoxal derivative). It is accordingly believed that phenylpyruvic and para-hydroxyphenylpyruvic acids are first formed in the catabolism of phenylalanine and tyrosine, respectively. In confirmation of this, it has been noted that excretion of homogentisic acid is increased upon administration of both these compounds to alcaptonuric patients.

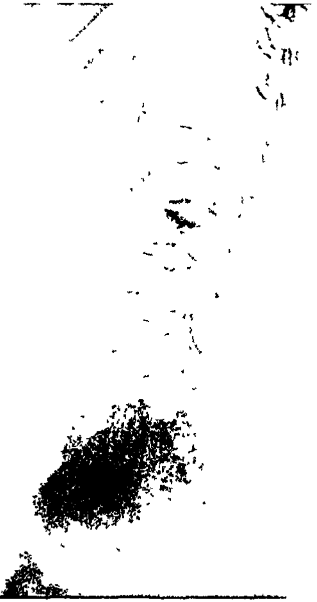
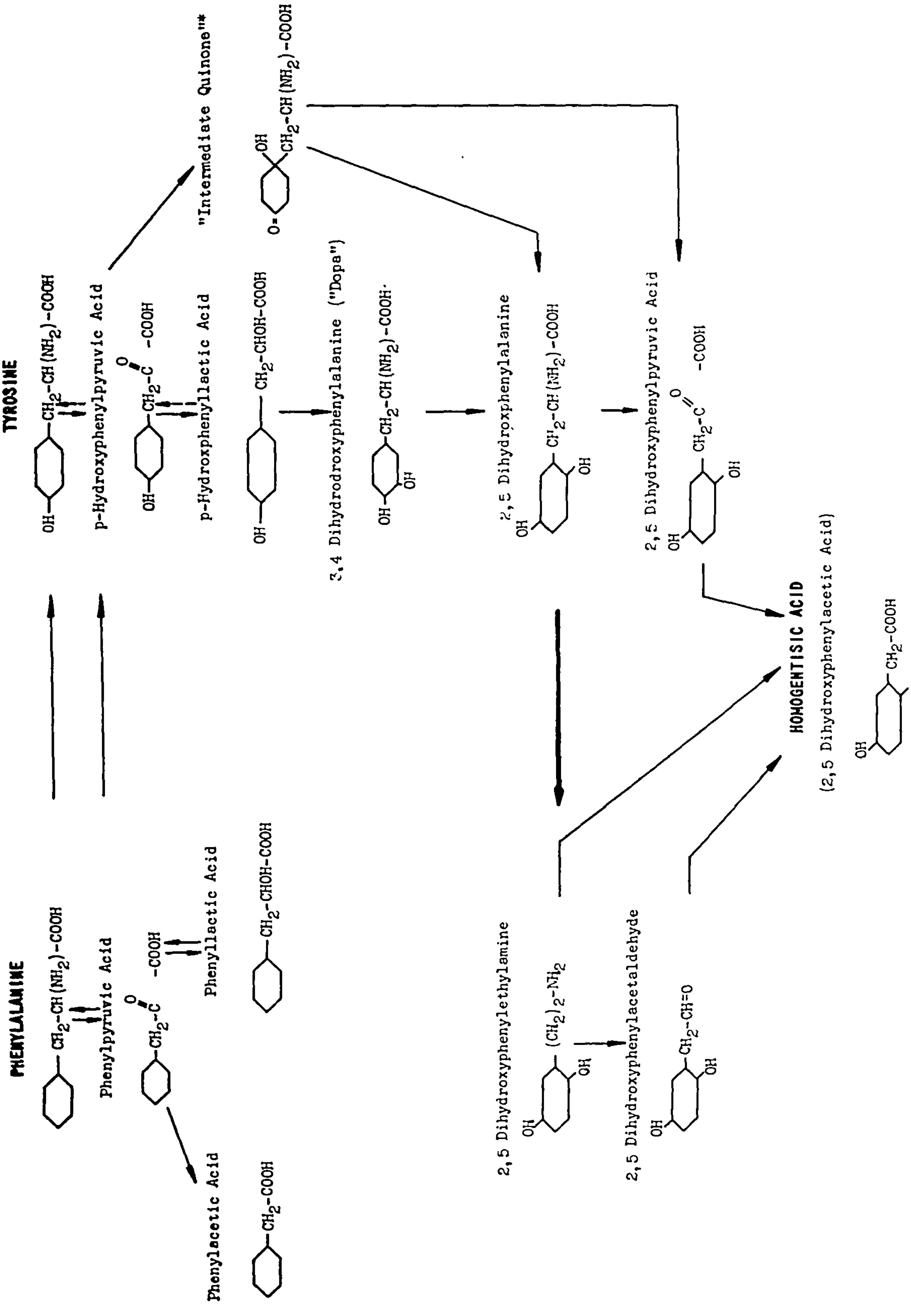


Fig. 1 (Case 1).—Laura F., aged 16. Roentgenogram shows transverse striation in the vertebral bodies, with widening of the intervertebral spaces and no evidence of calcification.

Upon perfusion through the surviving normal liver, however, phenylpyruvic acid, though it fulfilled the structural requirements as to its side chain, did not yield acetoacetic acid, whereas its para-hydroxy substituted homologue (parahydroxyphenylpyruvic acid) did. Coupled with evidence adduced by Blum[12] that of the three isomeric hydroxyphenylalanines only the para compound (tyros ro homogentisic acid when per-


PHENYLALANINE
TYROSINE
Phenylpyruvic Acid
p-Hydroxyphenylpyruvic Acid
Phenyllactic Acid
p-Hydroxphenyllactic Acid
Phenylacetic Acid
"Intermediate Quinone"*
3,4 Dihydrodroxyphenylalanine ("Dopa")
2,5 Dihydroxphenylalanine
2,5 Dihydroxyphenylpyruvic Acid
HOMOGENTISIC ACID
(2,5 Dihydroxyphenylacetic Acid)
2,5 Dihydroxyphenylethylamine
2,5 Dihydroxyphenylacetaldehyde

*Beta-(1-hydroxy-4-oxo-1,4 cyclohexadienyl) alanine.

Chart 2.—Patterns of phenylalanine and tyrosine metabolism.

sons, and the work of Neubauer, [13] *which* indicated that only the para-substituted hydroxyphenylpyruvic acid of the three isomeric hydroxyphenylpyruvic acids caused increased excretion of the acid, the fact that phenylpyruvic acid did not yield acetoacetic acid in perfusion studies led to the *belief that phenylalanine* is first converted into tyrosine and thence into parahydroxyphenylpyruvic acid in the course of metabolism.*

*Since further oxidation of either phenyl*pyruvic or parahydroxyphenylpyruvic acids would yield the corresponding acetic acids, which are excreted with intact benzene rings as the corresponding hippuric acids, the explanation for the increased output of homogentisic acid when these substances were fed to alcaptonuric patients must, of necessity, involve an alteration in the benzene ring. From the observations of Blum and Neubauer that only the para-hydroxy *compounds* are capable of yielding homogentisic acid, it is evident that the alteration in the ring cannot be one of direct hydroxylation in the 2,5 position, but, rather, must involve a relative reorientation of the hydroxyl groups and the side chain to achieve the ring structure of homogentisic acid (2,5 dihydroxyphenylacetic acid).

This reorientation was demonstrated by Neubauer, who discovered that of the respective reduction (lactic acid) products of the two previously mentioned phenylpyruvic acids, parahydroxyphenyllactic did not increase homogentisic acid excretion in alcaptonuric persons, whereas phenyllactic did. As contrasted with phenylpyruvic acid, which yields no acetoacetic acid on liver perfusion, phenyllactic did yield acetoacetic acid when perfused through the liver and was, in addition, completely destroyed in the normal organism. Parahydroxyphenyllactic acid, on the other hand, was oxidized only with great difficulty and did not appear to form acetoacetic acid.

To explain this apparent inconsistency, Neubauer postulated the existence of two intermediate compounds: first, an "intermediate quinone," and, second, the compound 2,5, dihydroxyphenylpyruvic acid. The presence of an intermediate compound with the quinone structure was *predicated upon the observation that on* oxidation of phenols (e.g., para-cresol) substances with the quinone linkage are produced which subsequently readily undergo molecular reorientation to form hydroquinones. This extremely unstable quinone substance presents a ready transition to hydroquinonepyruvic acid. This substance, 2,5 dihydroxyphenylpyruvic *acid, which would be situated between* para-hydroxyphenylpyruvic acid and ho*mogentisic acid, offers an understandable* and logical means through which hydroxylation of the ring with relative reorientation of the side chain to form homogentisic acid may be achieved.

Neubauer also pointed out the alternative possibility of the formation from the intermediate quinone substance of the compound 2,5 dihydroxyphenylalanine, which he believed was then converted by oxidation into hydroquinonepyruvic acid. In addition, this remarkable investigator postulated that 2,5 dihydroxyphenylala*nine might undergo decarboxylation to* form the compound, 2,5 dyhydroxyphenylethylamine, which then could be converted into homogentisic acid.

Recent studies by Neuberger and his associates[17] indicate that approximately 80 to 85 per cent of tyrosine or phenylalanine is first converted into 2,5 dihydroxyphenylalanine and thence into 2,5 dihydroxyphenylethylamine. Blashko, Holton and Sloane Stanley,[16] in indicating a similar *metabolic pathway, have shown that ho*mogentisic acid may be formed either *directly from this latter substance* (2,5 dihydroxyphenylethylamine) or under the *influence of an amine oxidase, indirectly* from it to 2,5 dihydroxyphenylacetaldehyde, which may then be oxidized to homogentisic acid.

At present, this sch ould , to
indicate that homog 'd -

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*Though Embden postulated this conversion, actual evidence for it was not available until 1940, when Moss and Schoenheimer[14] indicated that tyrosine samples isolated from the internal organs of rats fed synthetically prepared dl-deuterophenylalanine contained from 20 30 per cent of deuterium mal product of intermediary metabolism which, in the presence of alcaptonuria, fails to undergo further disruption into acetoacetic acid. There is certain evidence, however, that other catabolic routes may be available to phenylalanine and tyrosine other than the homogentisic acid pathway and that this latter pathway may, indeed, be abnormal.

Butts, Dunn, Hallman and Sinnbauer[17] have presented evidence suggesting the existence of other routes by showing that under certain conditions phenylalanine may yield low homogentisic acid whereas tyrosine does not. Chandler and Lewis,[18] in studying the oxidation of phenylalanine and phenylpyruvic acid, have shown that in rapid oxidation of these two compounds a certain portion may escape further oxidation while another portion may undergo further alpha oxidation to yield phynyllactic acid. It may well be that further chemical reorientation occurs prior to or coincident with the opening of the benzene ring, in which case there would be at least another available pathway.

The studies of Dakin on acetoacetic acid formation, previously discussed, led to the belief that homogentisic acid, instead of being a normal intermediary, was an abnormal product. This opinion was based upon the fact that para-methyl phenylalanine and para-methowy-phenylanine, both of whose structures preclude the formation of a substance with the quinone linkage, are completely disrupted in the normal organism and yield acetoacetic acid on perfusion through the liver, but do not increase homogentisic acid excretion in alcaptonuric patients. This evidence would appear to reaffirm Neubauer's theory in respect to the necessity of an intermediate quinone for the homogentisic acid pathway. It does, however, also indicate that alcaptonuric persons are able to oxidize phenylalanine and tyrosine derivatives if this pathway is not available. Herein, of course, lies the crux of the whole matter. It certainly has been shown that in the alcaptonuric patient the homogentisic acid pathway adequately explains the metabolism of phenylalanine and tyrosine. There is, however, no evidence available at present that this mechanism is necessarily the same in the presence of normal metabolism. Indeed, Fromherz and Hermanns[19] concluded that "there is undoubtedly a second, and perhaps even more paths for the catabolism of aromatic substances," and suggested that "the second path may lie through a pyrocatechin derivative, whereas the homogentisic acid path lies through derivatives of hydroquinone."

Though lack of space precludes more detailed discussion of the many sidelights of this subject, some brief note must be made here of the important facts that: (1) prematurely born children given diets deficient in Vitamin C have been observed to excrete parahydroxphenylpyruvic and parahydroxyphenyllactic acids;[20] (2) experimental alcaptonuria may be induced in common laboratory animals either by feeding relatively massive doses of phenylalanine or tyrosine or by maintaining the animals on Vitamin C-deficient diets;* and (3) there are interesting and readily manifested chemical relations of the two monoamino monocarboxylic aromatic acids to the hormones thyroxine and epinephrine. (The entire question of melanin formation and the precise chemical nature of the pigment (s) found in ochronotic cartilages and fibrous tissues, though certainly deserving of detailed attention, must likewise be omitted here).

Graphically summarized, the present state of knowledge concerning the metabolism of phenylalanine and tyrosine as related to alcaptonuria may be indicated in Chart 2.

From the diagrammatic representation of the chemical breakdown of the two amino acids, it is clear that several other "inborn errors of metabolism" are closely related to alcaptonuria. These include albinism, in which the blockage appar-

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*In both instances of vitamin C deficiency the disorder is *eliminated* by the administration of l-ascorbic acid. The metabolic steps involved in experimental alcaptonuria which appear to fall under *the influence of vitamin C* include those extending from the 2.5 dihydroxyphenylpyruvic acid stage up *to* rupture of the benzene ring.[21] Administration of vitamin C *to* genetic alcaptonuric patients, *however*, had *no* apparent effect (Diaz;[22] Monsonyi;[23] Sealock.[24]

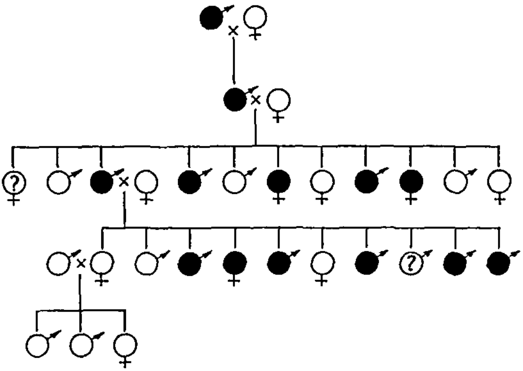

Chart 3—Genealogy of an alcaptonuric family, illustrating dominant transmission. Blackened figures indicate patients. (From K. Pieter).

ently occurs between the "dopa" (3,4 dihydroxyphenylalanine) and melanin stages; phenylketonuria (phenylpyruvic oligophrenia) and tyrosinosis. In phenylketonuria the failure resides in the inability *to further metabolize phenylpyruvic acid*,[25] whereas in the single case of tyrosinosis reported by Medes[26] there was inability to break down parahydroxyphenylpyruvic acid, which is itself a further catabolic product of phenylpyruvic acid. From the work of Beadle[27] it would seem that all of these diseases are characterized by lack of specific enzymatic control, which is genetically determined.

In general, the overall pattern of this genetic control appears to be predominantly recessive. Bateson[28] has shown that the incidence of alcaptonuria can be readily explained on the basis of Mendelian inheritance of recessive characteristics. In 37 families studied by Hogben,[29] in which all the offspring were known, 66 instead of the calculated theoretical 61.9 affected persons were found. This discrepancy is well within the limits of statistical error and tends to support the belief that both nonafflicted parents were heterozygous for the specific gene.

Characteristically, the transmission of recessive alleles is of the "skip" type and is manifested in alternate generations. Garrod,[2] however, noted 3 instances of direct transmission of alcaptonuria from *parent to child. One of these was observed* by Osler.[30] "An alcaptonuric father, whose brother also showed the anomaly, had an alcaptonuric son. The second case, which was recorded by Orsi,[31] was that of a mother and her son and daughter, all alcaptonuric; a third by Umber und Burger[32] of an alcaptonuric father who begat 4 alcaptonuric sons."

Pieter[33] described an interesting family in which an alcaptonuric father begat an alcaptonuric son, who in turn had 11 children, of whom 5 were alcaptonuric. Of these 5, a son sired 10 offspring, of whom 6 were alcaptonuric, and a daughter bore 3 children, none of whom were affected (Chart 2). Since that time Smith[34] has reported a case previously studied by Pomeranz, Friedman and Tunick,[35] in which a father, 2 of whose brothers presented the disturbance, had 3 daughters and 1 grandchild similarly afflicted.

Though this type of direct transmission is admittedly unusual, the very f of it occurrence would seem to warrant further consideration of the genetic factors involved. The history of the family here reported is especially interesting because it presents 3 instances of direct and 2 of indirect transmission. In the latter 2 the condition resulted from a consanguineous marriage.

The point of special importance is that in the group of indirect inheritance the percentile distribution of alcaptonuric descendants is approximately the same as that in the group of direct inheritance. Despite the skipping of a generation and the consanguineous marriage, the 1:1 ratio instead of the more common 1:4 ratio would seem to argue in favor of the dominance rather than the recessiveness of the characteristic.

The family history begins with the marriage of Isiah F., a doctor of law, who died in 1914, and Altagracias, who died during childbirth in 1897. Of Isiah's siblings nothing is known, though he himself is said to have had black urine since childhood. Neither Altagracias, her sister nor any member of the maternal side of the family were known to be alcaptonuric.

As a result of the marriage of Altagracias and Isiah, 8 children were born. One of these, of whom nothing is known, died at the age of 1 month, but the others are all living. Of these 4 are unmarried and 1, Polybio, is alcaptonuric but has not been examined. Of the other 3, 2 are alcaptonuric. One of these, Pio, is normally married and has a daughter who is not alcaptonuric. The other, Marcia, is normally married and has had 8 children, none of whom present the disturbance. Three of her children are normally married and have had 7 children, all of whom are reported to be normal. Of the 4 living nonalcaptonuric members of the family, 1, Pericles, has had 7 children, none of whom show any trace of alcaptonuria. The other, Perseus II, himself normal, married his cousin Teolinda, the daughter of Altagracias' sister. They have had 4 children, 2 of whom are normal and 2 of whom have typical alcaptonuria.

The 4 persons whose cases are here reported (Chart 4) have all been examined and proved to be alcaptonuric. The absence of the disturbance in other members of the family is recorded without verification, since the majority live abroad and are not readily available for study.

Brief summaries of the 4 cases are justified because of the light they shed upon the chronologic appearance of the triad of symptoms which has been described as characteristic of alcaptonuria: (1)

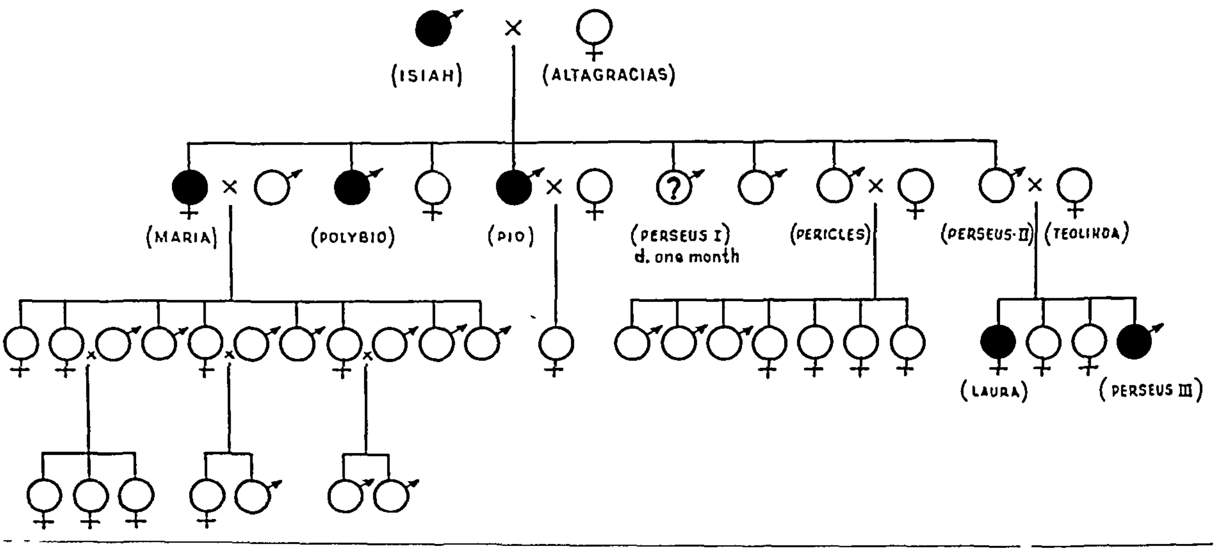

Chart 4.—Genealogy of the family here described, illustrating both direct and indirect transmission.

deeply colored, brown-black urine, (2) pigmentation of the cartilages, fibrous tissues and sclerae and (3) arthritis

REPORT OF CASES

CASE 1 —Laura F, aged 16, was first seen in 1946 She is the offspring of the marriage between cousins, her father, Perseus II, having married Teolinda, a cousin on his mother's side Beyond the fact that the patient had passed 'black urine' since childhood, her medical history presented nothing unusual At the age of 2, and again at 8, she fractured her left leg At the age of 4 she had some sort of abdominal pain which was tentatively diagnosed as appendicitis but which apparently subsided with a change of diet In 1943, at the age of 13, she began to complain of pains in the lower part of her back

Examination disclosed no limitation of motion in the spine, hips, knees or shoulders There was some impairment of hearing in the right ear, and there was a pronounced bluish discoloration of the sclerae but no discoloration of the aural or nasal cartilages was observed The urine turned dark mahogany color upon prolonged exposure to the air

Roentgen study of the spine in 1946 showed marked generalized halisteresis, with numerous transverse lines of calcification in the bodies of the vertebrae The intervertebral spaces were slightly widened, but there was no evidence of calcification The symphysis pubis was quite clear but there appeared to be some clouding of the sacroiliac joints Roentgen examination of the spine in December 1950, when the patient was 20 years old, showed a definite increase in the width of the intervertebral spaces (fish mouth) with definite narrowing of the vertebral bodies There was no evidence of calcification anywhere within the vertebral column (Fig 1)

CASE 2 —Perseus III, aged 21, was seen and examined in 1946 The brother of Laura (Case 1) he was the offspring of marriage between cousins, and like his sister had passed deeply colored urine since birth He observed that whenever he was excited his urine became darker than usual His parents noted that if his diapers were immediately washed discoloration could be prevented If, however, they were left unwashed, the diapers became brown and finally indelibly black At the age of 5, like his sister, the boy began to complain of "pain in the stomach" Operation was advised but refused, and since then he has continued to complain intermittently of pain The results of a gastrointestinal roentgen series have been reported as negative, though clinically the patient presented the symptoms of duodenal ulcer

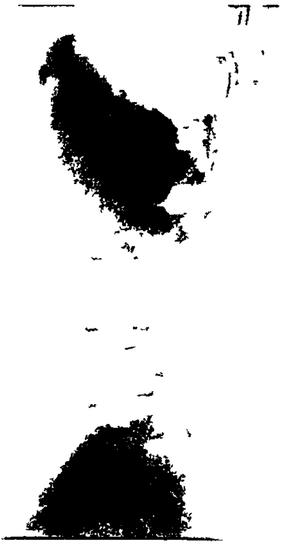
Fig 2 (Case 2) —Perseus F III, aged 21 Roentgen study disclosed no evidence of any changes in the discs.

In 1930, at the age of 4, he began to complain of occasional pain in the lumbosacral area This pain has continued intermittently, but examination in 1947 disclosed no clinical evidence of any impairment of function in the spine, hips or knees A roentgenogram of the lumbar portion of the spine (1946) disclosed no evidence of pathologic change The symphysis pubis was clear, but there was a slight clouding of both sacroiliac joints The patient described occasional dislocation of the jaw, but the temperomandibular joints were roentgenographically normal A roentgenogram of the lumbar portion of the spine taken four years later (1950) showed no essential change and no evidence of calcification in the intervertebral discs (Fig 2)

CASE 3 —Maria M, aged 54, when first seen

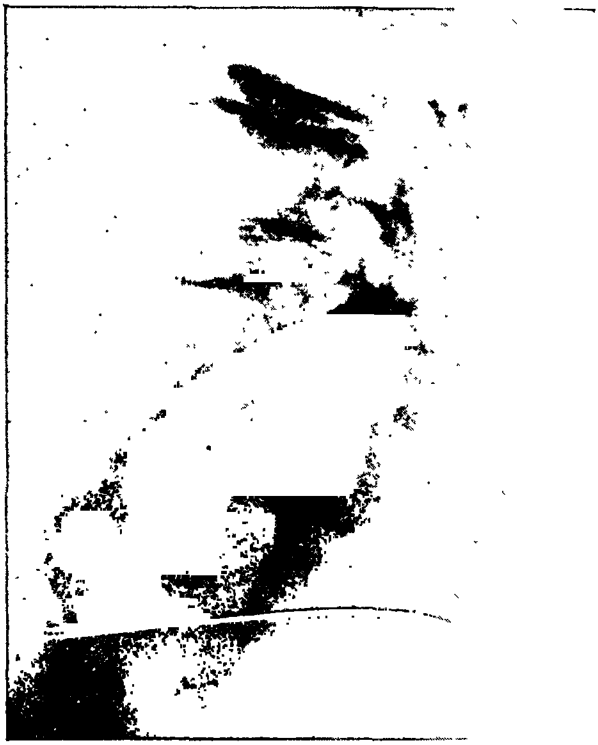

Fig. 3 (Case 3).—Maria M., aged 54. Roentgenogram shows narrowing of the intervertebral spaces with typical disc calcification.

in 1946, stated that she had passed "black urine" since childhood. She observed that whenever she was excited or had taken mustard or beer with her food the urine became noticeably darker. Since childhood she has complained of "pains in the back." These pains, usually located in the lower portion of the spine, have gradually become more severe and have involved successively higher levels of the lumbar and dorsal portions of the spine.

Examination disclosed the typical discoloration of the auricular cartilages without any abnormal discoloration of the sclerae. There was loss of lordosis and limitation of motion in the lumbar region but no impairment of motion in the dorsal or the cervical portion of the spine, hips, knees, ankles or shoulders. The temporomandibular joints moved freely.

Roentgenograms disclosed a marked narrowing of the intervertebral spaces in the lower dorsal and upper lumbar areas. Irregular calcium deposition in the intervertebral discs of these areas and sclerotic changes along the contiguous borders of the vertebrae were noted (Fig. 3). The cervical portion of the spine, the sacroiliac joints, the knees, the shoulders and the temporomandibular joints showed no roentgenographic changes.

CASE 4.—Pio F. first came under observation in 1926 for treatment of a nonunited fracture of the right tibia suffered three years previously. After three unsuccessful attempts at bone grafting, union was finally accomplished in 1937 by means of a synostosis operation elsewhere described.[36] Despite repeated hospitalization and routine analyses, the presence of homogentisic acid in the urine appears to have escaped attention. The patient himself stated that he had been aware of the condition since childhood, and that he had noted increased discoloration of the urine after catching cold, after excitement of any sort and after drinking beer or eating mustard. In 1929 he had undergone a tonsillectomy at another hospital, also without any suspicion of his underlying metabolic disorder. It was not until 1946, when Maria volunteered the information in explanation of her own backache, that Pio was questioned with regard to himself.

At that time he had no complaints referable to his back and had only slight pain in the right shoulder. The ears showed the typical discoloration and pronounced rigidity. Roentgen study revealed extensive calcification of the auricular cartilages and diminution of the joint space of the right hip, with slight sclerosis of the acetabular rim. The knees (Fig. 4) showed generalized osteoporosis with osteoarthritic manifestations. The right shoulder and the wrists showed no changes which could be associated with alcaptonuric ochronosis. There was chronic hypertrophic osteoarthritis of both sacroiliac synchondroses. The lower dorsal and lumbar vertebrae showed narrowing of the intervertebral spaces with calcification of the remaining intervertebral discs (Fig. 5). In the cervical portion of the spine the discs were narrowed, without any evidence of calcification.

In the early part of 1949 the patient struck his left knee against a chair, and a painful effusion developed. In the absence of any history of locking, clicking or giving way of the left knee joint he was considered to be suffering from ochronotic arthritis, and the knee was treated by aspiration, compression bandage and physiotherapy, without relief. He was subsequently seen at the Presbyterian Hospital, where a diagnosis of internal derangement was made and arthrotomy was performed on October 3. An abstract of the patient's record indicated that at the time of operation a tear of the posterior end of the medial semilunar cartilage and "several areas of osteochrondritis dissecans" had been found. This, however, was not nearly as startling as the appearance of the tissues when the joint was opened. The articular cartilage was greenish black, the synovial villi were hypertrophied and greenish black, the cruciate ligaments were only slightly tinted and the joint capsule was essentially normal in color, as were the overlying subcutaneous and cutaneous tissues.

Microscopic examination revealed degeneration and fragmentation of the articular cartilage. "Many of the irregular fragments were diffusely pigmented with finely dispersed brownish material. Around the margins, many similar fragments were imbedded in cellular fibrous tissue in which there were many small vessels, with scattered lymphocytes and plasma cells. Similarly, the matrix of the elastic cartilage of the meniscus was diffusely though less deeply pigmented. The synovial tissue was composed of cellular fibrous tissue similar to that described about the margins of the articular cartilage. The tissue also contained many jagged fragments of brownish cartilage. In the surrounding fibrous tissue were many large mononuclear cells which contained granules of orange-brown pigment" (Fig. 6).

After an uneventful recovery from the arthrotomy, the patient soon began to complain of pain in the right shoulder and the right knee. Roentgenograms of both shoulder and knee (December 1950) failed to disclose any evidence of calcification. The knee was diffusely swollen, and aspiration produced 60 cc. of a blood-tinged clear yellow viscid fluid. After clotting of the blood elements the synovial fluid showed no tendency toward discoloration even after prolonged exposure to air.

Only salicylates gave the patient some relief from pain. Sodium gentisate and potassium iodide were completely without effect.

As has been noted, the essential factor in recognition of alcaptonuria is the appearance of homogentisic acid in the urine. Usually it is the patient himself who directs attention to this condition after noting the discoloration of the urine or urine-soiled linens upon exposure to air. Occasionally it is disclosed accidentally by the finding of a reducing substance which does not act exactly as does a sugar. With Fehling's solution, an orange precipitate develops as with a sugar, but, in addition, the solution becomes dark brown. This is in itself sufficient to suggest the presence of homogentisic acid, but a number of other tests may be used to identify this substance.

Fig. 4 (Case 4).—Pio F., aged 50. Roentgenogram of the knee shows generalized halisteresis with evidence of osteoarthritis.

It does not lead to fermentation and does not rotate polarized light. With Nylander's alkaline bismuth solution, homogentisic acid does not precipitate metallic bismuth. With Millon's reagent (mercurous nitrate in nitric acid) a yellow precipitate is formed, *in contradistinction* to the brick-red precipitate usually found with any compounds containing the phenolic grouping. Addition of dilute ferric chloride to homogentistic acid in solution yields a transitory deep blue color, as contrasted with the dark green produced by phenylpyruvic acid and the Bordeaux red produced by ketone bodies. With 10 to

40 per cent solution of ammonium hydroxide, an intense reddish-violet color was obtained by Mörner (Ztbl. für PhysiologischeChemie, vol. 19).

Treatment of homogentisic acid solutions with silver nitrate in excess ammonium hydroxide, the so-called "silver mirror test," brings about a rapid reduction even in the cold with the liberation of free silver. The action of homogentisic acid on silver salts probably forms the basis of Fishberg's qualitative test[37] utilizing photographic film. Methods for the quantitative determination of homogentisic acid are well summarized by Neuberger,[15] and there are numerous other reports concerning the isolation of the diphenol acid from urine.

Though alcaptonuria is usually present from birth, Garrod[2] noted that it "is occasionally met with as a temporary sign of disease" and recorded Winternitz' statement, "of the mother of seven children, 3 of whom were alcaptonuric, whereas two of the children have passed alcapton urine from their earliest days, in the case of the youngest child, she only noticed the peculiarity when she (the child) was five years old." In this respect, it is interesting to recall 2 cases. The first of these reported by Sutro and Anderson[38] was that of a 42-year-old soldier who stated that for the past five years the urine had turned brownish-black when it was exposed to the air. The second is that reported by White, Parker and Block,[39] of a 59-year-old white man who had first noticed blackish discoloration of the ears twenty-five years before, at which time it was observed that his urine became black on standing. Whether these cases represent inaccurate observations prior to clinical recognition of the disturbance or whether they represent some variation in the excretion of homogentisic acid are questions which, while interesting, are incapable of solution on the evidence at hand.

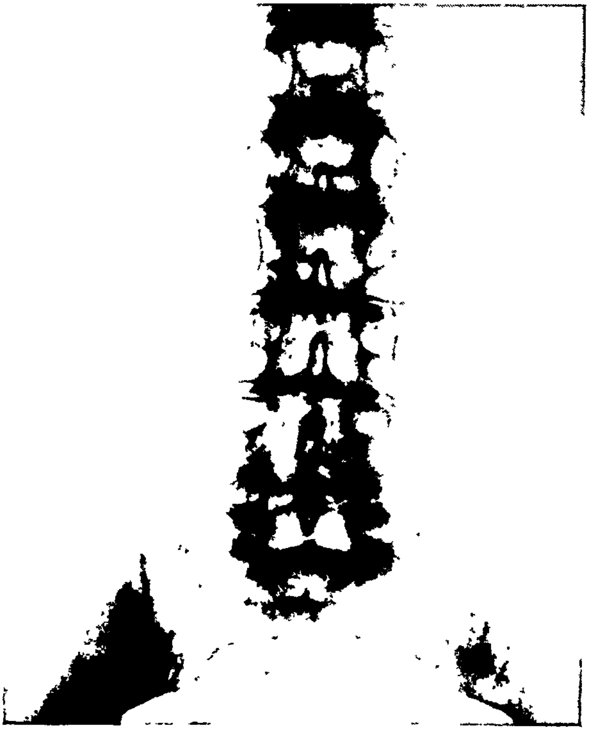

Fig. 5 (Case 4).—Pio F. Roentgenogram shows narrowing of the intervertebral spaces with calcification of the discs.

Though alcaptonuria is at most a matter of inconvenience during childhood, in adult life it constitutes the keystone of the pathognomonic triad of symptoms-alcaptonuria, ochronosis and arthritis-described by Howard and Mills.[40] Ochronosis, the second of the semiologic triad was first accurately described and named by Virchow[41] in 1866. In his Mills.[40] Ochronosis, the second of the semiologic triad was first accurately described by Virchow[41] in 1866. In his record of the necropsy observations on a 67-year-old man, dead of a recent cerebral injury, Virchow noted that the rib cartilages, the intermediate cartilages of the sternum and the symphysis pubis, the laryngeal, tracheal nasal and aural cartilages and the cartilage covering the articular surfaces of the bones, as well as the patellar tendons and the rectus femoris tendon, all showed discoloration varying from yellow to dark brown. The interesting point was that the discoloration appeared to be in the nature of an *imbibition* process, since it was least on the surface and became darker as the tissue approached the more vascular bony area.

This is the more remarkable in that it seems to contradict his specific observation that the pigmentation "is strictly localized in those parts that are without nerves and blood vessels."

Generally speaking, the alcaptonuric patient, even though informed of his metabolic error, remains completely unaware of the ochronosis until attention is attracted to the rigidity and bluish discoloration of the aureal or nasal cartilages (Fig. 7). Another equally reliable and possibly even earlier manifestation of ochronotic pigmentation is found in the scleral coating of the eye. Smith[34] noted that "though Hecker and Wolfe are universally credited as the first to describe the discoloration of the eyeball in 1899, scleral pigmentation was the first observed by Osler four years earlier." The pigmentation affects chiefly the exposed portions of the sclerae and is beautifully illustrated in Smith's colored plates, of which those here presented (Fig. 8) are black and white reproductions.

In the past, two primary forms of ochronosis, that due to the use of carbolic acid dressings and that associated with alcaptonuria, have been described. (Other cases, in which the origin was undetermined, have also been reported.) Schecter and Taylor,[42] as well as other observers, have reported pigmentation of the eye, aural and nasal cartilage, epiglottis and skin following the use of atabrine. Poulsen[43] noted of 32 known cases of ochronosis that in 17 there was alcaptonuria, in 8 carbolic acid dressings were applied and in 7 the cause was unknown.

In what has gone before, attention has been centered chiefly upon the metabolism of the aromatic acids. The possibility of phenol formation and absorption from the intestine cannot be entirely neglected. Not all the ingested protein is necessarily digested and absorbed in the intestinal tract, and particles of food as well as bacterial detritus may reach the large intestine, where it undergoes bacterial putrefaction. This may occur as a result of the chemical breakdown of the aromatic amino acids either by [illegible] or by deamination. In the case of [illegible] decarboxylation yields [illegible] which upon [illegible] yields [illegible] and [illegible] phenol. [illegible] in the formation of [illegible] which [illegible] yields [illegible] and [illegible] with the [illegible] and [illegible] phenol.

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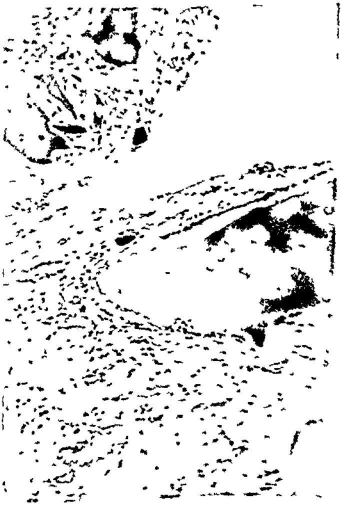

Fig. 6 (Case 4).—[illegible] showing necrosis and [illegible] in the [illegible] lunar cartilage [illegible]. Courtesy of Dr. [illegible]

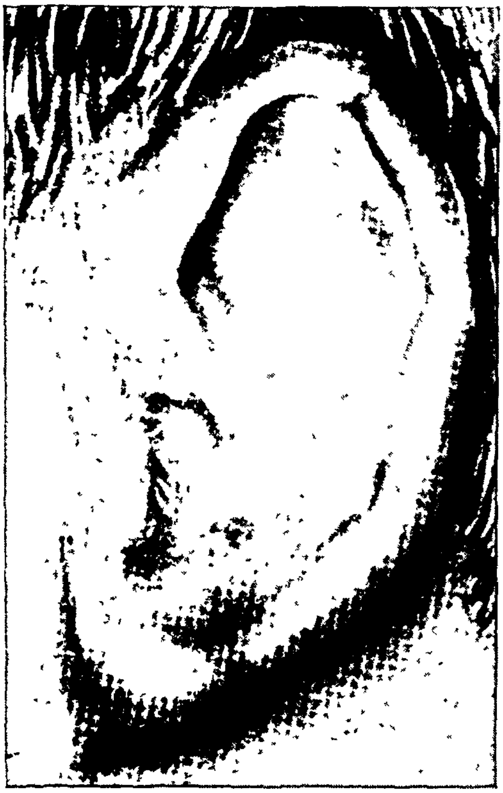

Fig. 7.—Discoloration of the aural cartilages in the ochronotic patient reported by Dr. J. W. Smith. (J.A.M.A. 120-1282, 1942).

gree account for the color of alcaptonuric urine. In the "exogenous" condition due to carbolic acid as in the "endogenous" condition arising from the homogentisic acid, the presence of the phenyl radical appears to be the essential factor in the production of the pigment(s).

Excluding its possible formation in the lower bowel and with the virtual disappearance of phenol as an antiseptic dressing, alcaptonuria must be considered by far the most significant source of ochromotic pigmentation. Though the pigment circulates freely in the blood stream, it is deposited almost selectively in tissues which are degenerating or in which the free circulation is diminished. In none of the cases thus far described has the pigmentation in either the aural cartilages or the eye been noted clinically in a person under the age of 23.

The nature of the pigment is not definitively established, though most authorities feel that it either is, or is closely related to, melanin or one of the melanins. It is in this regard that the chemical relation existing between the aromatic amino acids and thyroxine and epinephrine may again be mentioned. It is probably because of these chemical affinities that the pigmentation of the skin observed in Addison's disease, Riehl's melanosis, melonosarcoma and melanosis coli, or in the syndrome of generalized intestinal polyposis, which is associated with melanin deposition in the oral mucosa, the lips and the digits may occasionally have to be differentiated from that associated with alcaptonuric ochronosis.

Arthritis, the third of the triad of symptoms, is chronologically the latest and clinically the most distressing consequence of the metabolic disturbance. In the original studies of Virchow it was observed that the articular cartilage was "motheaten" and showed signs of degeneration. There were numerous cartilaginous excresences, osteophytic outgrowths with ossification in the synchondroses.

Subsequently designated as "ochronotic arthritis" by Osler, it has since been named more specifically "alcaptonuric arthritis." Numerous writers, including Gross and Alard,[44] have called attention to the arthritic manifestations associated with alcaptonuria. Sutro (lo. cit.) reported a case of the formation of joint mice in alcaptonuric patient, a condition previously described by Ubermuth[45] as "chondrosis dessicans ochronotica." Södergbergh[46] particularly stressed the roentgen picture, as did Crossfill[47] in reporting a case of alcaptonuria associated with spondylitis ankylopoietica. The roentgen characteristics have been excellently described by Pomeranz and his co-workers.[35] In the spine, increased dorsal kyphosis and lumbar lordosis are observed. The vertebral bodies are normal in height but show general decalcification and vertical striation. The intervertebral discs appear as oval calcifications, which are most marked in the lumbar area. The costal cartilages may be calcified. The shoulder joints are narrowed. The glenoid fossae are eburnated and present large spur formations. The "humeral heads are mushroomed and present roughly circular areas of resorption on their articular surfaces. Irregular flocculent calcific deposits are seen in the soft tissues, apparently distributed in the course of the supraspinatus tendon as well as within the subdeltoid bursa" . . . "The pelvic bones are slightly decalcified but there are no striations such as are seen in the vertebral bodies. The sacroiliac articulation may be narrowed. . . In one of our cases there was calcification of the pubic cartilage with fusion of the pelvic bones. The hip joints are of average width and the articular cartilages present no *gross abnormality.*" Calcifications have been noted in the soft tissues and "in the tendinous attachments to the greater trochanter of the femora. The knees may show similar depositions within the quadriceps and to a lesser degree the patella tendons."

Of these various arthritic manifestations, calcification of the intervertebral discs is most striking. Keenly aware of its diagnostic significance, Pomeranz even ventured to make the diagnosis of alcaptonuria on the basis of this alone. When present it is highly suggestive but would not appear to be pathognomonic. Not all alcaptonuric persons present this symp*tom, even if they have reached the age* at which it may be expected. On the other hand, calcification of single intervertebral discs has been reported in a number of different conditions, and also after trauma, prolapse, etc. Multiple calcification (Fig. 9) may be observed in cases of osteoarthritis without any evidence of alcaptonuria. Albert[18] reported the case of a 49-year-old man who had generalized osteoarthritis of all the large joints and in whom disc calcifications were noted at the age of 37. Albert looks upon this type of disc calcification as merely the final phase of the various disc generations which have been described by Schmorl as "spondyloses deformans, in itself to be considered as a true osteoarthritis of the *spine." Considering the rarity of alcapto*nuric arthritis and the relative frequency of osteoarthritis, these two conditions presenting the same roentgen appearance would have to be definitely differentiated upon the basis of their clinical reactions. From the few cases observed over any length of time, it would appear that calcification of the discs, when present, is a late manifestation of the disorder and chronologically would seem to come after the ochronosis. On the other hand, the clinical manifestations of pain in the spine would seem to appear relatively early, chronologically antedating recognition of the ochronosis. This is quite consistent *with the predilection of homogentisic acid*

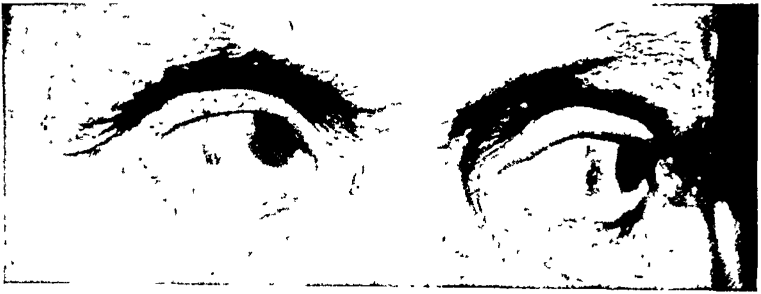

Fig. 8.—Scleral discoloration in a case of ochronosis reported by Dr. J. W. Smith, (J.A.M.A. 120-1282, 1942).

Fig. 9 (Case 5).—Julia G. Nonalcaptonuric patient with generalized osteoarthritis. Evidence of pathologic change in the intervertebral disks is manifested by Schmorl nodules and multiple foci of disc calcification.

for cartilage. It may well be that Schmorl nodules and the widening of the intervertebral discs are merely precursors of the late stage in which complete degeneration of the disc with calcification occurs. Whether the homogentisic acid is deposited in discs already diseased or whether it is the homogentisic acid which leads to disc degeneration is something that further study alone can elucidate.

SUMMARY

1. The metabolism of the aromatic amino acids tyrosine and phenylalanine has been reviewed with respect to the formation of homogentisic acid.

2. The genealogy of a family presenting evidence of both direct and indirect transmission of this disorder is recorded.

3. The semiologic triad of alcaptonuria, ochronosis and arthritis with calcification of the intervertebral discs is discussed.

RÉSUMÉ

1. Le métabolisme des acides aminés aromatiques, tyrosine et phénylalanine, est passé en revue en relation de la formation de l'acide homogentisique.

2. On rapporte la généalogie d'une famille présentant les signes de cette affection par transmission directe et indirecte.

3. On discute le trépied séméiologique d'alcaptonurie, ochronisie et arthrite avec calcification des disques intervertébraux.

ZUSAMMENFASSUNG

1. Es wird ein Ueberblick ueber den Stoffwechsel der aromatischen Aminoessigsaeuren. Tyrosin und Phenylalanin mit Hinblick auf die Bildung von Alkapton gegeben.

2. Der Stammbaum einer Familie ist verzeichnet, der sowohl die direkte als auch die indirekte Uebertragung dieser Stoerung nachweist.

3. Die Symptomentrias von Alkaptonurie, Ochronosis und Gelenkentzuendung mit Verkalkung der Zwischenwirbelscheiben wird eroertert.

RESUMEN

1. Se revisa el metabolismo de los aminoácidos aromáticos tirosina y fenilanina en lo que respecta a la formación de ácido homogentísico.

2. Se recuerda la genealogía familiar que presenta evidencia de transmisión directa e indirecta de este trastorno.

3. Se discute la tríada semiológica de alcaptonuria, ocronosis y artritis con calcificación de los discos intervertebrales.

RIASSUNTO

1. Analizzano il ricambio basale di acidi amino aromatici, tirosine fenilamine riguardo la formazione di acido omogentisico.

2 La genealogia d'una famiglia presentando evidenza entrambi diretta ed indiretta di trasmissione di questa malattia e' registrata

3 Discutano la triade semiologica di alcaptonuria, echronosi, ed artrite con calcificazione dei dischi intervetebrali

SUMÁRIO

1. O metabolismo dos amino acidos firosina e fenilalanina foi revisto com respeito a'formacão de acido homogentisico

2 E'relatada a genealogia de uma familia que apresenta evidencia de ambas transmissões, direba e indireta, dessa desordem

3 E discutida a briade semiotica alcaptonuria, *ochromose e arbrite com* calcificacão dos discos intervertebrais

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Trephine in Acute Frontal Sinusitis

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PHILADELPHIA

DURING the past decade the treatment of acute infections has greatly changed. The discovery and use of the newer antibiotic and chemotherapeutic agents are responsible for this change. This has been reflected in otorhinology by a change in the indications and need for surgical intervention. In addition, the frequently dreaded complications that accompanied surgical treatment of acute infections of the ear, nose and throat have disappeared.

An increasing knowledge of nasal physiology and the function of the ciliated epithelium has also modified the types of operation performed.

In the treatment of acute infections of the frontal sinus, utilization of this newer knowledge has resulted in a change of therapeutic and operative methods, which has produced a more rapid recovery. This paper is concerned with the treatment of acute empyema of the frontal sinus and/or of acute exacerbation of chronic frontal sinus suppuration.

The incidence of loculated empyema of the frontal sinus requiring surgical drainage is relatively small. At present, acute frontal sinusitis in most cases will respond to the use of the newer therapeutic agents and relatively minor local procedures. These include infraction of the middle turbinate, irrigation of the frontal sinus after the method of Van Alyea, and local nasal drainage. It is in those cases in which symptoms persist and adequate drainage is not obtained that the technic of trephining the frontal sinus to be described is useful.

Since 1946, at Temple University Hospital, we have had occasion to treat 10 patients on whom this operation was performed. A description of these cases will be given.

Trephine of the frontal sinus and its results have been the subject of reports by Boies,[1] Brown,[2] Goodyear[3] and Walsh.[4] In treating acute empyema of the frontal sinus by trephine of the floor of the frontal sinus, the following objectives are accomplished:

The frontal sinus is entered through a relatively avascular area. The operation is quickly performed and, most important, injury to the mucosa of the nasofrontal duct is avoided. Hilding[5] and Walsh[4] have shown that when the mucosal lining of the sinus ostia is destroyed it is impossible to obtain proper drainage from the paranasal sinuses despite the type of operation. This is true especially of the frontal sinus, where, to quote Walsh,[4] ". . . the enlargement of the nasofrontal duct effected in the intra-nasal frontal operation is doomed to failure. The normal mechanism of drainage from the frontal sinus is destroyed in this procedure which is based on the faulty hypothesis of gravity drainage. Furthermore, the removal of mucous membrane and trauma of bone result in new bone formation and complete occlusion of the operatively formed ostium, the end result being an infected sinus which does not communicate with the nose."

The operation is indicated for (1) acute empyema of the frontal sinus or acute exacerbation of a chronic frontal sinusitis which has failed to respond to modern conservative treatment or (2) intracranial complications of acute frontal sinusitis, such as brain abscess, meningitis or subdural abscess, when it is necessary to drain the primary focus of infection quickly, without predisposing to further intracranial spread. This subject has been most thoroughly discussed by Courville.[6]

The technic of the operation is quite

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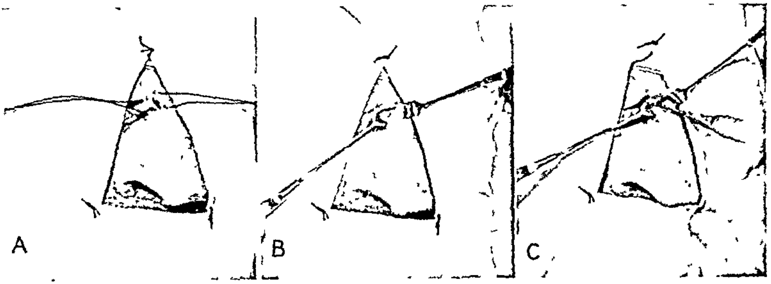

Fig. 1.—*A*, incision marked out. Two heavy silk traction sutures may be placed on each side of the incision These often control bleeding and act as retractors. *B*, floor of frontal sinus exposed. Small hand retractors may be used instead of the traction sutures. *C*, floor of frontal sinus entered with the perforating burr The opening is enlarged to permit introduction of a No. 14-18 catheter, French. (Cadaver specimen.)

simple. Methods have been described by other surgeons, and no claim for originality is made in the method presented. The operation may be done with either local or general anesthesia. Local anesthesia is accomplished by local infiltration with procaine 1 per cent along the line of incision and nerve block of the supraorbital and anterior ethmoidal nerves. The patient is adequately prepared by preoperative chemotherapy or antibiotic therapy. Preanesthetic sedation is given as indicated. The skin of the face, frontal and orbital regions is prepared. The eyelids are closed by a suture of fine silk (No. 6:0) to protect the cornea. The incision is approximately ½ inch (1.2 cm.) long and is made at a point midway between the inner canthus of the eye and the dorsum of the nose. It reaches from the level of the inner canthus to the under surface of the supraorbital ridge. This incision is marked off first with methylene blue or by light scarfication of the skin. Two heavier silk sutures of No. 3:0 black silk are then passed on each side of the incision and parallel to it (*A* and *B*, Fig. 1). These sutures are placed deep down the bone, with an attempt to pass down to the periosteum, and will act as traction sutures, often controlling the bleeding by their pressure. After the sutures are passed, the incision is completed down to the bone. If some bleeding is still present despite the traction sutures, this can be controlled by electrocoagulation. With an elevator, the periosteum is elevated just enough to permit the entrance of a small perforating burr of the Lempert type, such as is used in mastoid surgery. The perforating burr (Fig. 1*C*) is inserted and pointed medially and superiorly to enter the thin bone of the floor of the frontal sinus. Once the burr is entered, the ostium is enlarged only enough to permit the introduction of a No. 14 French catheter. No attempt is made to curet or in any way to increase traumatization of the periosteum or lining membrane. Boies[1] has brought out that this opening should be posterior to a line extended upward from the posterior lacrimal crest, since cancellous bone may be present in the anterior wall of the frontal sinus. As soon as the sinus is entered, there is usually an escape of purulent exudate under great pressure, and this is most often attended by immediate relief of pain and headache. The catheter is then inserted into the sinus and sutured to the edge of the skin (Fig. 2*A*). The two traction sutures may be tied over to close the wound. A small dressing is applied.

Postoperatively the wound is irrigated several times daily with physiologi tion of sodium chloride, and t introduced into the catheter and thus into the interior of the sinus a solution of penicillin, bacitricin or tyrothrycin, as desired. This irrigation is easily accomplished by introducing a 20-gauge needle (Fig. 2*B*), within the lumen of the catheter, so that there is room around the needle for the return flow. The tube is allowed to remain in place until the irrigating fluid is known to enter the nasal cavity through the nasofrontal duct. This would indicate that the edema and inflammation of the mucosa lining the nasofrontal duct have subsided and the patency of the duct is reestablished. The tube is then removed, and the wound is allowed to heal without further suture. When healing is complete, the scar is almost invisible. On a few occasions, when the tube had been removed too soon and there was a recurrence of symptoms, it was easy to spread the incision and reinsert a catheter without the need of further operation.

In our hands this technic has resulted in rapid recovery in the cases to be reported, without resorting to deforming surgical trauma of the frontal sinus, intranasal rasping, or technics that might disturb the integrity of the nasofrontal duct. In several cases in which there was evidence of chronic frontal sinusitis, with acute symptoms, this operation was employed preliminary to the radical frontal sinus operation. This allowed for control of the infection by the proper therapeutic agents without the danger of breaking up protective barriers or opening vascular channels in bone, which might have led to an osteomyelitic process.

The operations reported were performed by the authors and by Dr. B. J. Ronis at the Temple University Hospital.

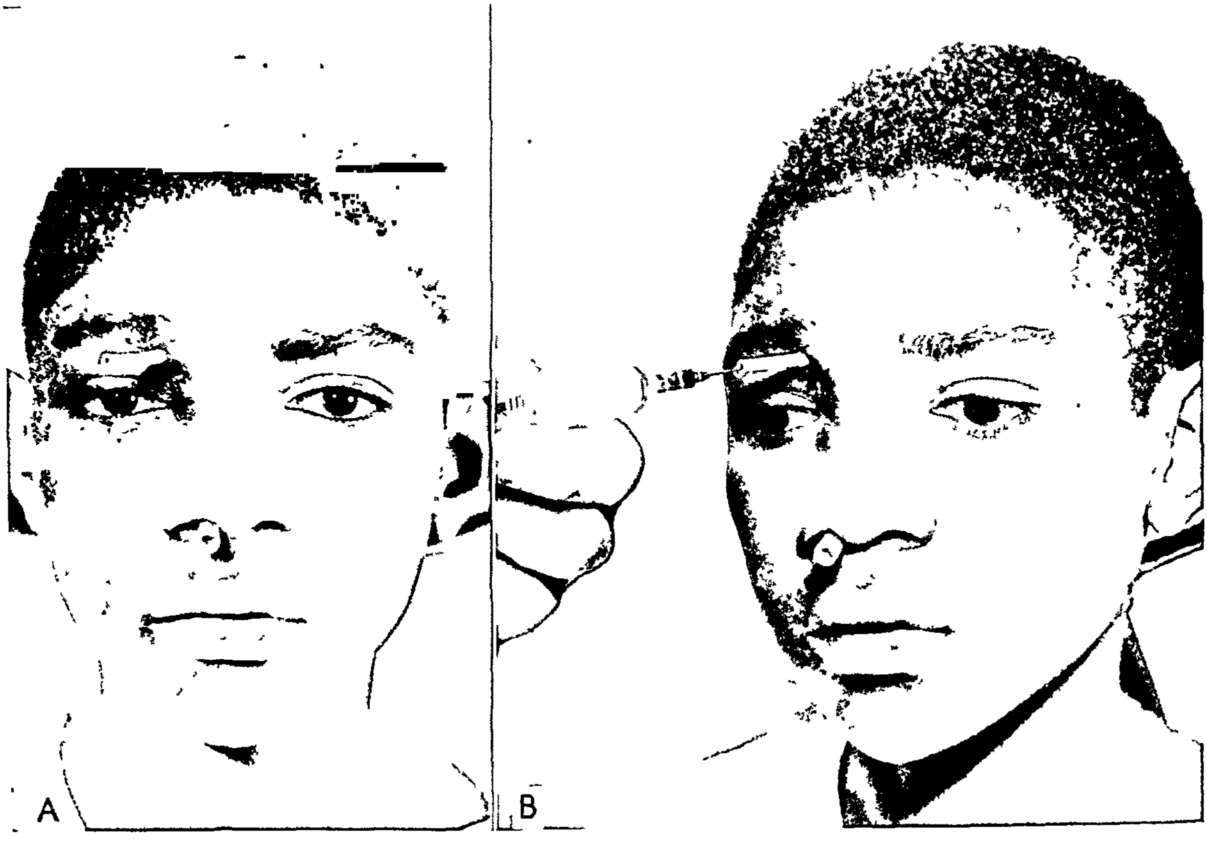

Fig. 2.—*A*, catheter in place, anchored to edge of wound with a silk suture. Wound closed with interrupted black silk. *B*, wound is irrigated several times daily. A 20-gauge needle is used so that there is room around the needle for the return flow.

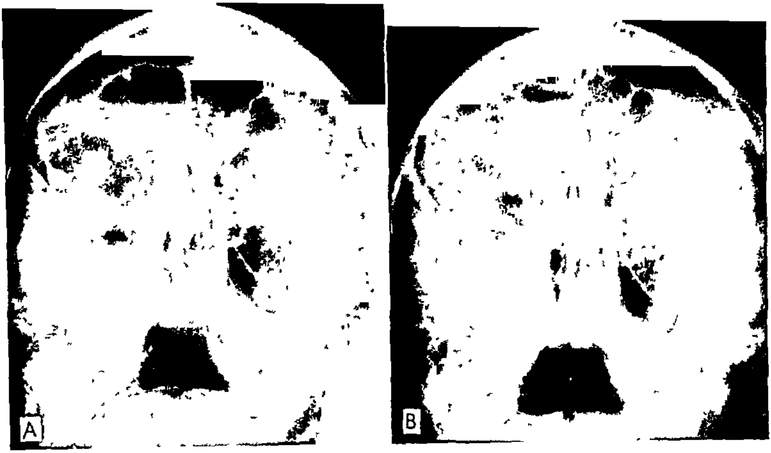

Fig 3—*A*, patient P T, Case 1. Fluid level revealed in right frontal and maxillary sinuses on admission to hospital. *B*, increase of fluid level in frontal sinus despite local nasal treatment and chemotherapy.

The privilege of reporting these cases is acknowledged.

REPORT OF CASES

CASE 1.—P. T., a white boy, aged 14, was admitted to the Temple University Hospital on July 11, 1946. Two days before admission *he had felt severe pain over the right eye* after swimming. There was an elevated temperature (101 F.) accompanied by chills. Pain and tenderness were present in the right frontal sinus area. Intranasal examination revealed a scant purulent discharge, with marked congestion of the nasal mucosa. Roentgen study revealed a fluid level in the right frontal sinus and infection of the right maxillary sinus (Fig. 3*A*). The patient was treated with 1 Gm. of sulfadiazine every four hours, and 20,000 units of penicillin administered intramuscularly every three hours, accompanied by local intranasal therapy. Under this regime the pain and tenderness *subsided, the temperature was normal and the* patient was clinically improved. However, repeat roentgen films taken on July 17, six days after admission (Fig. 3*A*), revealed an increase of the fluid level. Therefore, on that day, a trephine of the right frontal sinus was performed with the patient under general anesthesia. This was followed by the discharge of a great amount of purulent material. The culture was reported as showing Haemophilus influenzae. An intranasal right maxillary sinusotomy was done at the same time. Postoperatively the patient was continually treated with penicillin and sulfadiazine. The sinus was irrigated with saline solution three times daily, and penicillin solution (5,000 units to 1 c. c.) was introduced into the frontal sinus. On the sixth postoperative day the irrigating fluid was discharged into the nasal cavity and the drainage tube was removed. The postoperative course was uneventful and the patient discharged in good condition on the eighth postoperative day. There was no further occurrence of symptoms, and the patient has been well since.

CASE 2.—G. F., a white man, aged 53, was admitted to the Temple University Hospital on Dec. 16, 1946, with the following history: Three weeks before, after an acute infection of the upper part of the respiratory tract, there was pain over the right eye. There was clinical evidence of infection of the right frontal sinus. The patient was treated conservatively with sulfadiazine, penicillin and local nasal treatment without relief of his symptoms. He was hospitalized, and roentgen examination on December 19 revealed right frontal, ethmoid and maxillary sinusitis. The right frontal sinus was almost devoid of air (Fig. 4*A*).. The pain over this sinus was intense. On December 19, three days after admission, a trephine of the floor of the right frontal sinus was done with the region under local anesthesia. When the sinus was entered with the perforating burr, a great amount of thick pus under pressure escaped immediately. A catheter was inserted into the sinus. Through this catheter penicillin solution was introduced several times daily. The postoperative course was uneventful. There was complete relief of pain. On the fourth postoperative day the irrigating fluid was returned through the nasofrontal duct into the nasal cavity and the tube was removed. The wound was allowed to close. The patient was discharged on the fifth postoperative day. The right antral sinusitis had been treated by irrigation through the natural ostium.

CASE 3.—B. B., a white boy aged 16, was admitted to the Temple University Hospital on Dec. 17, 1945. An acute infection of the part of the upper respiratory tract had developed several days before admission. There was severe pain over both frontal regions, with frequent nosebleeds. There was considerable purulent discharge in each nasal chamber. The symptoms persisted despite local therapy and the systematic administration of penicillin. Roentgen examination revealed that both frontal sinuses and both maxillary sinuses were clouded (Fig. 4*B*). On December 26, nine days after admission, an operation was done with the region under local anesthesia. Both frontal sinuses were trephined by the technic outlined, and a bilateral intranasal maxillary sinusotomy was done. Pus was present under tension in both frontal sinuses. Culture of the organism revealed hemolytic streptococci, Group A. During the postoperative period the frontal sinuses were irrigated several times daily, and the patient was discharged apparently well, two weeks after the operation. On Feb. 8, 1946, about five weeks after the first operation, a severe infection of the upper part of the respiratory tract again developed. This was accompanied by edema of both frontal and orbital regions. A bilateral external frontal operation, Lothrop Skillern technic, was then performed by Dr. Ersner. This case illustrates that in the presence of an acute infection of the frontal sinus the trephine operation is very valuable as a preliminary step to a radical frontal operation. If the trephine is performed, after the acute symptoms have been controlled with sulfons and/or penicillin, localization of the infection occurs. The trephine, through a relatively avascular area, produces good drainage without disturbing the cancellous bone or the vascular channels. This in itself will prevent many complications. Many times this will suffice. If, however, there is a recurrence of the infection, the more extensive radical operation can be performed when the infection is well localized and well controlled.

CASE 4.—L. C., a white youth aged 19, was admitted to the Temple University Hospital on Sept. 9, 1948. This patient had an infection of the upper part of the respiratory tract about three weeks before admission to the hospital and had apparently recovered. He was well until September 9, when he felt severe pain in the right frontal region and over the right eye. The pain was associated with drowsiness and fever. There was no nasal obstruction or postnasal drip. He had never had a similar attack. Apparently these symptoms came on after swimming and diving. Examination revealed tenderness over the bridge of the nose and the inner aspect of the orbit bilaterally, and localized tenderness over the right frontal region. On admission the patients temperature was 100.4 F.; on the second day, 103 F. The patient was treated with penicillin given intramuscularly, 50,000 units every three hours. The right eyelid was moderately swollen and tender, and there was tenderness on pressure over the right supraorbital region. Roentgen examination (*C* and *D*, Fig. 4) revealed moderate changes in the mucous membrane of the paranasal sinuses, on a basis of sinusitis. There was a marked mucosal thickening in the right frontal area. There was no definite fluid level. On September 15, with the region under local anesthesia, the floor of the frontal sinus was entered with a dental burr. Thick pus, which was pulsating and under pressure, was obtained. The culture proved to be Staphylococcus aureus. Two small catheters were placed in the frontal sinus through which the sinus could be irrigated. Postoperatively the temperature subsided to nor-

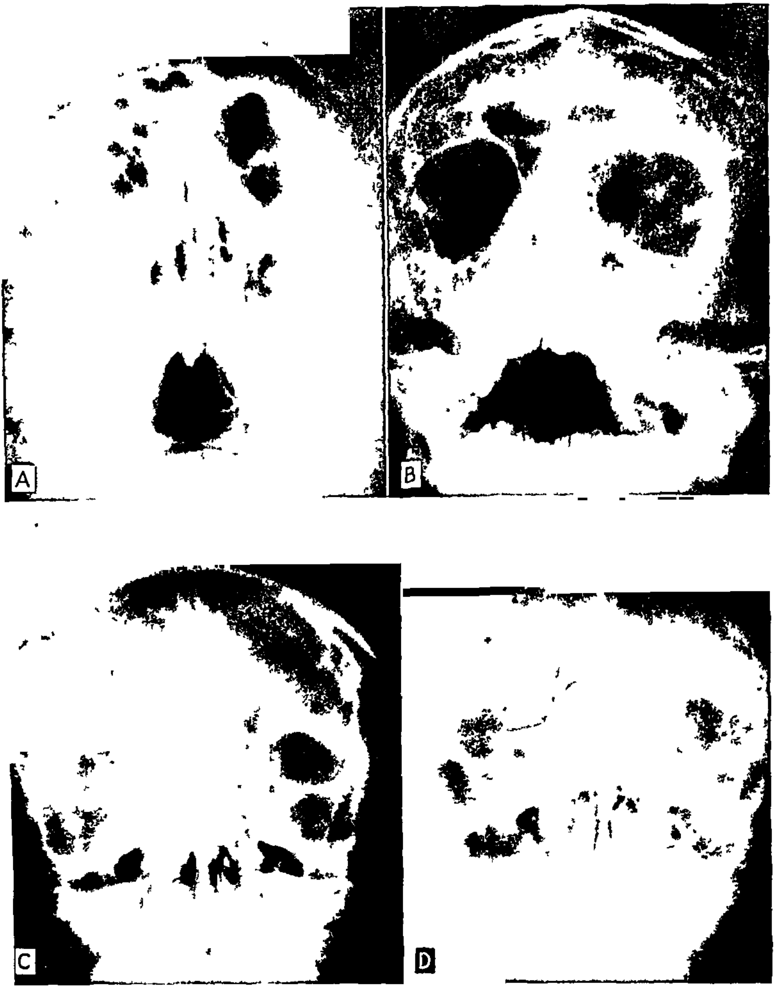

Fig 4 —*A*, patient G F (Case 2), aged 53 Fluid level in right frontal sinus (*a*) despite strenuous sulfone and penicillin therapy and local nasal measures Recovery followed trephine of right frontal sinus *B* patient B B (Case 3) Bilateral frontal sinusitis with fluid level, bilateral maxillary sinusitis Treated by trephine of frontal sinuses and bilateral ma sin my *C*, patient L C (Case 4), aged 19 Right pansinusitis with empyema of ri l Treatment was trephine of frontal sinus, patient recovered *D*, patient L C tive with drainage tubes in place Two tubes had been inserted to pro riga As a rule, with our present technic only one drainage

mal by the second day. The patient received duracillin, 300,000 units every twelve hours. The sinus was irrigated each day through the drainage tube with warm physiologic solution of sodium chloride. On the sixth postoperative day the sinus was irrigated and the fluid drained into the nose. This was an indication that the nasopharynx was patent, therefore at that time the tubes were removed. The patient did exceedingly well postoperatively, and was discharged on the tenth postoperative day.

CASE 5.—L. F., a white man aged 39, was admitted to the Temple University Hospital on Jan. 3, 1947. He complained of pain over the right eye and cheek which had been present for two weeks prior to admission to the hospital. Roentgen examination (Fig. 5*A*) revealed extensive chronic disease involving the frontal and ethmoid sinuses and both antrums, with maximum involvement in the right frontal region. On January 3, with the region under local anesthesia, a trephine of the right frontal sinus was done. The usual incision was made and the skin and periosteum were elevated. The floor of the frontal sinus was entered with a perforating burr. This was followed by the escape of air and a seropurulent discharge. A catheter was inserted into the trephine opening. Postoperatively the patient was treated with penicillin parenterally, and penicillin was instilled into the tube and thus into the frontal sinus. There was considerable postoperative edema. On January 7, the fourth postoperative day, after nasal irrigation, the fluid returned through the nasofrontal duct into the nose, so that the tube was removed. The culture revealed hemolytic staphylococcus aureus. The patient did well and was discharged on the seventh postoperative day. This case illustrates the fact that in a patient with chronic sinusitis, in the event of acute infection, it is safer to obtain drainage by conservative means rather than to risk extensive radical operation during the acute phase. If necessary, the radical procedure may be performed at a later date. This patient had no further symptoms and has been well to the time of writing. It has been known that the presence of thickened mucous membrane on roentgen examination is not in itself an indication for radical operation.

CASE 6.—R. B., a boy aged 14 years, was admitted to the Temple University Hospital on June 29, 1947. The patient stated that he had been in apparent good health until two days before admission, when he began to have a right frontal headache. This became more severe, and in the morning on awakening his right eye was swollen shut. His temperature was elevated, and he was referred to the hospital.

The patient was seen by the Ear, Nose and Throat Department on the following day. Examination revealed edema of the right eye and over the right frontal region. Nasal examination revealed congestion of the nasal mucosa and the right inferior and middle turbinates. Considerable pus was noted on the floor of the nose and under the middle turbinate. The temperature was 103 F. There was some suspicion of a meningeal involvement, but the examination of the spinal fluid revealed no abnormality. The right antrum was irrigated, and a large amount of purulent drainage was obtained. It was recommended that this patient be carried along on chemotherapy until the infection showed evidence of localization. Then, if necessary, a trephine of the frontal sinus could be performed and drainage instituted, with a window operation on the antrum.

Roentgen examination (*B* and *C*, Fig. 5) on June 29 revealed hazy abnormal density throughout the right maxillary sinus and a fluid level in the right frontal sinus. On July 2 with endotracheal anesthesia, a trephine of the right frontal sinus was done. A great amount of pus was obtained under pressure. A right intranasal maxillary sinusotomy was also done. Postoperatively the temperature was 101 F., but with the use of penicillin (50,000 units every three hours) the temperature subsided by lysis and remained normal throughout the patient's stay in the hospital. The frontal sinus was irrigated several times daily with penicillin solution and on July 9 the tube was removed from the frontal sinus and the wound allowed to close by second intention. Culture of material from the frontal sinus revealed nonhemolytic staphylococci. The patient was discharged on the ninth postoperative day. A follow-up examination revealed no further difficulties.

This patient illustrates very well the benefits of modern therapy. The toxic symptoms and the infection were controlled by the use of sulfons and penicillin. Drainage was obtained by simple means, and recovery was quick and complete.

CASE 7.—W. H., a white man aged 29, was admitted to the Temple University Hospital

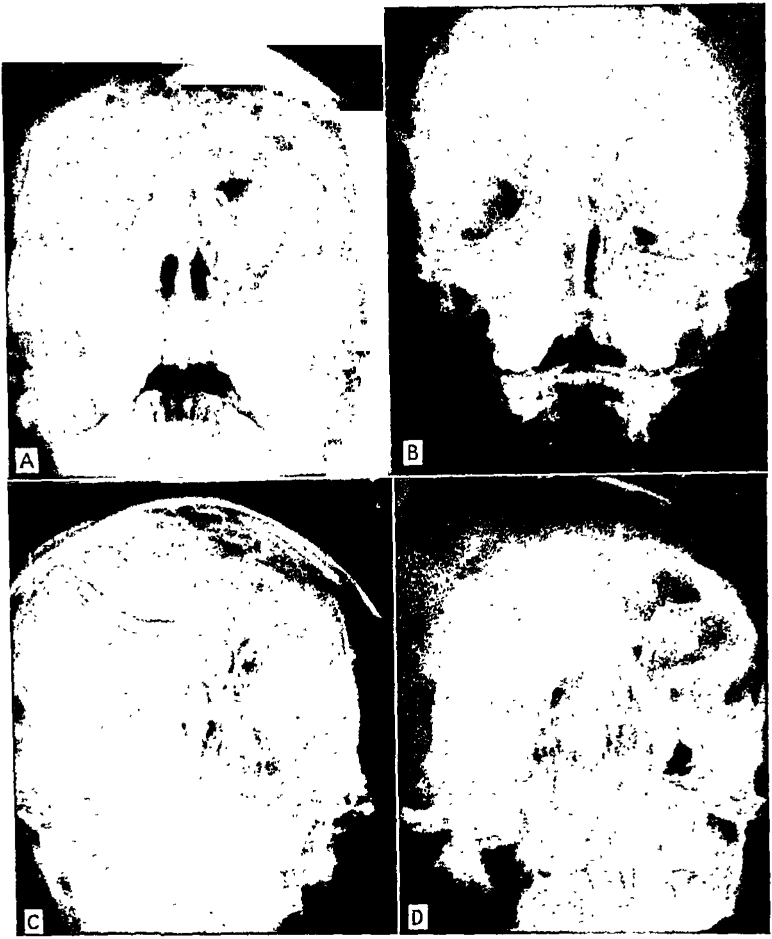

Fig. 5.—*A*, [illegible] illustrates an acute exacerbation of chronic sinusitis. Acute phase treat[illegible] [illegible] recovery. Evidence is afforded that the presence of thickened mucosa is n[illegible] radical operation on the sinus. *B*, patient R. B. (Case 6), aged 14. Acute empyema of frontal and maxillary sinuses; meningismus. Localization with sulfone and penicillin therapy. Drainage by trephine of right frontal and maxillary sinusotomy. *C*, patient postoperative film, showing drainage tube *in situ*. *D*, patient W. W., aged 29. Persistent right frontal headaches due to empyema of right frontal sinus. Obstruction of nasofrontal duct, probably due to marked septal deviation. Recovery followed trephine of right frontal sinus and submucous resection.

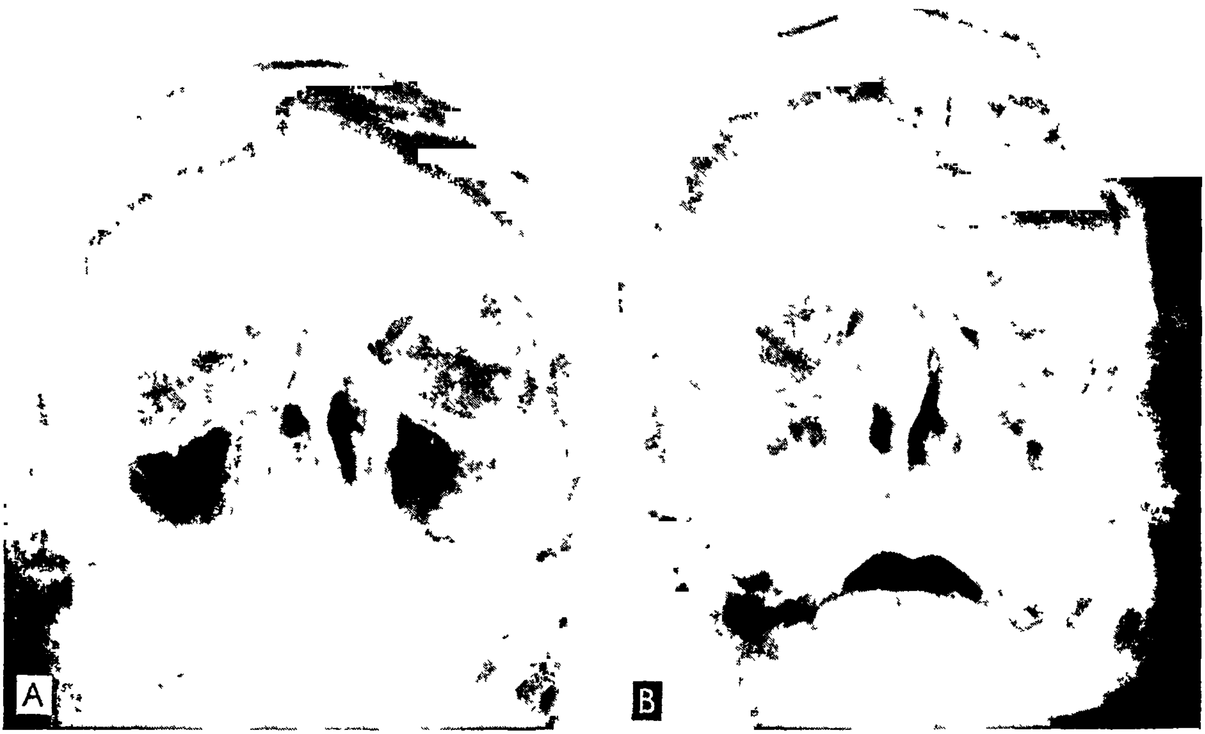

Fig. 6.—*A*, patient J. P. (Case 8). Severe left frontal sinusitis with recovery after trephine and drainage. *B*, patient S. G. (Case 9). Chronic pansinusitis; multiple nasal polypi; empyema of right frontal sinus. Note extensive pneumatization of frontal bone. Recovery followed intranasal polypectomy and trephine of right frontal sinua.

on Feb. 4, 1949. This patient was first seen on Jan. 31 of the same year, with a history of frequent headaches and considerable nasal obstruction. The headaches were present almost daily. No relief was obtainable by the usual medical treatment. Three years before, while in the service, he had had a sinus infection which necessitated puncture of the right antrum. The headaches were constantly right-sided, without radiation, and confined to the right frontal region. On examination the nasal mucous membrane was red and congested. There was a septal deviation to the right, with a septal spur. On transillumination, the right frontal sinus was clouded. No purulent drainage was noted on shrinking the nasal mucosa. Roentgen examination (Fig. 5*D*) on February 2 revealed thickening of the mucosa of the right frontal sinus and a suggestion of a fluid level. On February 7 with the region under local anesthesia, a trephine of the floor of the right frontal sinus was done. The frontal sinus was entered with a perforating burr. A great amount of thick, green pus under great pressure poured from the trephine opening. A No. 18 French catheter was inserted, and the wound was closed with interrupted black silk sutures. Postoperatively the frontal sinus was irrigated with penicillin and physiologic solution of sodium chloride several times daily. There was some edema of the upper lid. On the fifth postoperative day there was a return of the fluid through the nose. At this time, a submucous resection was done because of the nasal obstruction from the deviated septum. The tube was allowed to remain in the frontal sinus in anticipation of a postoperative reaction. It was removed on February 18. The patient was afebrile during his entire stay in the hospital. Culture of the pus revealed H. influenzae. The patient was discharged on the eleventh postoperative day.

CASE 8.—J. P., a white man aged 29, was admitted to the Temple University Hospital on Feb. 22, 1948, complaining of severe left frontal pain and constant nasal and postnasal discharge. These symptoms had been present for some time. Clinical and roentgen examination (Fig. 6*A*) revealed empyema of the left frontal sinus. On February 25, with the region under local anesthesia, a trephine of the left frontal sinus was performed, and a No 14 French catheter was inserted through the trephine opening The culture revealed Staphylococcus aureus Postoperatively, the patient was given penicillin parenterally and the frontal sinus was irrigated with penicillin solution through the drainage tube The postoperative course was uneventful The tube was removed on the fifth postoperative day, and the patient has had no further complaints referable to the sinus

Case 9—S G, a white man aged 53, was admitted to the Temple University Hospital on Jan 28, 1948 This patient had severe pain over the right frontal sinus region Nasal obstruction and nasal discharge were present Rhinoscopic examination revealed numerous polypi in the right ethmoid region Roentgen examination (Fig 6*B*) revealed the right frontal sinus to be filled with an abnormal density, probably mucopus Both frontal sinuses were unusually large, and the right frontal sinus extended into the vertical plane of the frontal bone to an unusual extent There was no evidence of osteomyelitis The patient's history revealed that seven years before he had had an episode of sinusitis that cleared under local therapy The present attack apparently followed a tooth extraction six weeks before admission On January 29 a right intranasal ethmoidectomy and polypectomy were done with local and block anesthesia The right frontal sinus was trephined in accordance with our usual technic Thick, creamy pus under pressure was obtained The patient was given penicillin parenterally, and the frontal sinus was irrigated through the drainage tube with penicillin solution The postoperative course was afebrile and uneventful The tube was removed on the seventh postoperative day, and the patient was discharged four days later

Case 10—F A, a youth aged 18 years, was admitted to the Temple University Hospital on Jan 29, 1948 The patient was semicomatose on admission An acute infection of the upper part of the respiratory tract had developed two weeks before admission, but the patient had sought no medical care There was a purulent nasal discharge, as well as increasingly severe frontal headaches, more marked on the left side Three days before admission the patient was noted to be aphasic and complained of his right arm There were four generalized convulsions

Examination revealed the following data The patient obeyed simple commands The right arm was noted to be in a state of convulsion during the examination There were positive Kernig and Brudzinski reactions, and nuchal rigidity was noted The spinal fluid was cloudy and under tension Otorhinologic examination revealed marked tenderness over the left frontal sinus and profuse purulent discharge from each nasal chamber Roentgen examination (Fig 7) revealed the presence of pansinusitis, with maximum involvement in both frontal sinuses Neurosurgical examination was made by Dr Henry Wycis This revealed right facial weakness, motor aphasia and complete paralysis of the right arm and leg The clinical diagnosis was probable abscess of the left frontal lobe and purulent frontal sinusitis Emergency operation was performed on the evening of admission Dr Wycis made a trephine opening in the left frontal region The dura was thickened and inflamed When the dura was opened a gush of purulent material was obtained, which indicated the presence of a subdural abscess A tube drain was inserted When the neurosurgical procedure was completed, a bilateral trephine of the frontal sinuses was done with the region under local anesthesia There was no drainage in the right frontal sinus, but when the left frontal sinus was opened a great amount of green, purulent material was obtained under pressure Culture of material

Fig 7—Patient F A (Case 10) Severe bilateral frontal sinusitis, meningitis, subdural abscess Reco[illegible] fol[illegible]ved trephine of both frontal sinu[illegible] [illegible]e neurosurgical intervention w[illegible] [illegible]l persis[illegible] [illegible]fone a[illegible] dmin

from the left frontal sinus and the subdural abscess was reported as showing Streptococcus haemolyticus. The patient had a very stormy convalescence, but recovered and was discharged from the hospital on the forty-sixth postoperative day. The details of the postoperative treatments will not be given. The frontal sinus infection was treated by irrigation with penicillin solution. On the sixth postoperative day the drainage through the nasofrontal duct was reestablished and the tube was removed.

This patient illustrates the type of case so well described by Courville[6]. Here was a neglected case of frontal sinusitis which eventuated into a subdural abscess, probably as the result of vascular extension. Courville[6] recommended early trephine drainage of the frontal sinus to prevent this complication. In this patient, whose condition was so critical, good drainage was obtained quickly and efficiently without the shock that a radical operation would produce. It was planned that, if the trephine drainage proved inadequate, a more extensive operation would be done when the patient was in better condition. However, he did so well that this was not necessary. The infection in the frontal sinus healed completely, as indicated by follow-up clinical and roentgen examination.

SUMMARY

Details of 10 cases of frontal sinus disease treated by trephine of the floor of the sinus are reported. In the authors' experience this type of treatment has given excellent results. It is felt that the opportunity to produce localization of the infections is afforded by the use of sulfons, penicillin and the newer drugs which are also available. When localization has occurred, drainage can be easily affected by trephine through the relatively avascular floor. This technic should prevent many of the dreaded intracranial complications frequently seen in the past, such as osteomyletis of the frontal bone and skull, meningitis and brain abscess. The operation has sound experimental, physiologic and clinical bases to support its use. It is not suggested that this supplant other surgical procedures applicable to the frontal sinus, but certainly in cases of the type herein presented it has a definite place.

L'auteur rapporte 10 cas de maladie du sinus frontal traitée par la tréphine. L'expérience de l'auteur sur le sujet est satisfaisante. Il préconise la localisation de l'infection par l'usage de sulfamidés, de la pénicilline, et d'autres. Une fois l'infection localisée, le drainage se fait facilement avec de la tréphyne à travers un placher peu vascularisé. Ce procédé devrait prévenir certaines complications intra-craniennes tant redoutées dans le passé, telles que l'ostéomyélite frontale et cranienne, la méningite et l'abcès cérébral. L'opération a des données expérimentales, physiologiques et cliniques sures à l'appui. Ce procédé n'a pas la prétention de supplanter les autres techniques chirurgicales du sinus frontal; seulement de prouver par le cas icic rapporté que le procédé a son application dans l'autre cas secondaire.

RESUMEN

Se comunican particulares de 10 casos de enfermedad sinusal frontal, tratados con trepanación del piso del seno. Se consideran excelentes los resultados de este tipo de tratamiento. Se opina que las sulfas, la penicilina y las nuevas drogas son útiles para localizer las infecciones. Esto facilita la canalización por trepanación de un piso relativamente avascular. La técnica en cuestión previene muchas de las temibles complicaciones observadas frecuentemente antes, osteomielitis del frontal y craneal, meningitis y absceso cerebral. La operación tiene bases experimentales, fisiológicas y clínicas. No se pretende que substituya a otros procediminutos después sin riesgo de reacción. pero tiene indicación definida en casos del tipo de los presentados.

RIASSUNTO

Riporta in dettaglio 10 casi di sinusite frontale trattato per trapanazione della parete inferiore del seno. Nell'esperienza dell'A questo tipo di trattamento ha dato hisultati eccellenti. Crede che l'opportunita' di produrre localizzazione dell'infezioni sia reso dal impiego di sulfoni, penicillin e piu' nuove medicine utile Qundo localizzazione si presenta, drenaggio puo' facilmente essere affettato per trapanazione traverso la parete relativamente avascolare Questa tecnica dovrebbe prevenire tante complicazioni endocranica spaventevole frequentemente osservate nel passato, come osteomielite dell'osso frontale e cranio, meningite e ascesso cerebrale L'operazione ha basi sperimentali, fisiologiche e cliniche a sostenere l'impiego Non si suggerisce questo soppianta altri procedimenti chirurgici applicabile al seno frontale, ma certamente in casi del tipo qui presentati ha un luogo definito

SUMÁRIO

Dethes de 10 casos de sinusite frontal biatoudos pela trepanacão do soalho de sinus foram relatados Em nossa experiencia, este tipo de tratamento deu excelentes resultados Fem se a intuicão de que a oportunidade para produzir a localizacão das infeccões e ofecida pelo uso de sulfas, penicilina e dro'gas mais recentes que são tambem aplicaveis Quando a localizacão ja ocorreu a drenegem pode ser facilmente executada pela trepanacão, atravez de um soalho relabinamente avascularizado Esta te'cnica pode evibar muitas das terriveis complicacões intracranianas frequentemente observadas no passado, tais como a osteomielite do osso frontal e do cranio, meningite e abcesso cerebral A operacão possue bases experimentais, fisiologicas e clinicas que autorizam seu uso Não se sugere que este metodo suplante oubros processos cirurgicos aplicaveis ao seio frontal, mas certamente conqequiu o mesmo definido lugar no aratamento de casos do arop apresentado

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To Our Contributors Abroad

We regret to announce that under current publishing conditions it has become impossible for the Journal *to arrange the translation into English of original articles submitted in other languages With the single exception of articles written specifically for the* Seccion en Espanol, *which, of course, do not require translation, we must therefore request that all articles henceforward be submitted in the English language Prompt publication can be greatly facilitated if all manuscripts are types in double or triple space to allow room for editorial corrections Your cooperation will be deeply appreciated*

Postoperative Dehiscence in Incisions Closed with Stainless Steel Alloy Wire

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A 56-year-old patient, Mr. L. S., convalescing from radical abdominoperineal excision of a cancer of the rectum, on the ninth postoperative day and after a rather large meal, experienced an episode of abdominal distention, nausea and vomiting. This was accompanied by a sudden peculiar sensation in the abdominal wound "as if something had broken". A few hours later a serosanguinous discharge was noted in the dressings, and the resident discovered a loop of small intestine protruding through a gaping area in the upper third of the incision.

Postoperatively, this patient had been in good physical condition and, except for several mild occurrences of nonobstructive ileus, his convalescence had been satisfactory. He had been ambulatory since the second postoperative day, and the sutures had been removed on the seventh day. The wound appeared to be healing well.

Of interest is the fact that our subject was relatively young and had not been debilitated by the effects of the cancer. He had lost no weight. He was well developed physically, though somewhat overweight, being of a short, muscular, stocky build.

What are the causes of this rather serious postoperative complication? In a review of the literature we encountered a multiplicity of theories and explanations, none of which seemed to be in harmony with our own observations. It therefore became our design to review our records and seek a common denominator to simplify, if possible, certain of the current opinions concerning postoperative wound dehiscence.

Among the chief etiologic factors usually stressed is delayed wound repair caused by hypoproteinemia.[1] Debilitation, lack of vitamin C,[2] anemia,[1a] old age,[3] and the presence of cancer[4] are other causes which have received much emphasis. The type of incision employed is believed by many to be of supreme importance,[1d] and most authors agree that the muscle splitting and transverse incisions are safest.[5] Exciting influences, such as severe coughing, vomiting, hiccoughing, and straining, have been reported by many.[6] A great controversy has raged over the choice of suture materials, and there is evidence of undesirable reactions affecting the approximated wound tissues in the presence of most absorbable and some non-absorbable varieties of suture.[7]

In our study we were able to evaluate the importance of specific causes by controlling to a large extent certain variable influences which, in most reviews of large numbers of cases selected from general surgical survices, have only served to multiply and diversify the resulting conclusions. At our disposal were the records of a large number of operative cases in which similar operations were performed with respect to extent of procedure, type of incision, operative time and suture material employed.

From our files of the past four years, the records of 515 consecutive cases were selected, in which relatively similar resections involving the large bowel had been performed. In each case a standard, extended paramedian incision beginning at the symphysis and reaching one half the distance between the umbilicus and the xiphoid was employed. The operations, for the most part, were extensive and averaged three to four hours in duration. In the series were 13 wound dehiscenses, an incidence of 2.5 per cent.

Of the patients in these 515 cases, 74 per cent were operated on for carcinoma,

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and among the group (26 per cent) in which the condition was nonmalignant colectomies and abdominoperineal excisions for chronic ulcerative colitis were most numerous Other resections were for diverticulitis, lymphogranuloma venereum and radiation proctitis

Interrupted sutures of stainless steel alloy wire were employed in the layers of all wounds, the most common technic being the use of interrupted figure of 8 sutures of No 30 wire in the fascia and *peritoneum*,[8] *No 35 wire in the* subcutaneous tissue and No 35 continuous lock stitch in the skin

There was an overall *mortality of 17*, or 3 3 per cent Two deaths occurred among the patients who suffered postoperative wound disruption

Forty three, or 8 3 per cent, of the operative procedures were palliative re sections for carcinoma of the large bowel in the presence of metastases in the liver *or lungs In none* of these cases did wound disruption occur, even though there was occasional involvement of the liver in more *than* two thirds

Prolonged, debilitating operations for the radical removal of carcinoma were carried out in 32 patients In 28 there were abdominopelvic lymph node dissections, and in 4 pelvic exenteration with transplantation of the ureters was performed None of these patients experienced wound disruption

Although preoperatively there existed cancer in each of the 13 with wound de hiscence, *for the most part* these patients were in good physical *condition* and had not shown more than minimal weight loss None of them required preoperative blood transfusions, and their nutritional states were above the average Each of the thirteen operative procedures was curative, and the outlook in each case was better than average

In our series, elderly patients did not *seem susceptible to wound separation* The oldest patient among the 13 with wound dehiscence was 68 The average age was 57 3 years In the overall series the average was 54 3 years, but in this group there were 80 patients 70 years or over *in whom the postoperative complication* did not occur

The average weight among the 13 patients with wound dehiscence was 162 4 pounds (73 7 Kg) This figure alone means little, but when it is associated with the average height of 5 feet 3 4 inches (162 cm) one can picture a patient who is short, stocky and usually overweight for his height Table 1 illustrates this height-weight relation

*Also noted in Table 1 are the provoca*tive events which preceded wound disruption in each case It will be noted that each patient experienced the reaction of some internal force or combination of forces capable of producing severe tension on the suture line These forces assume two forms one is exerted by the sudden contraction of thoracic and abdominal muscles, and the *other is the result of a* rapid and violent contraction of the dia*phragm The two forces, acting together*, produce wound disruption

Severe *contractions of the thoracic and abdominal muscles place a direct strain* upon the midline of the abdomen, and this may be great enough to cause separation of the upper third of a paramedian incision, where the strain caused by the elevation of the costal margins is most marked The vigorous contraction of the diaphragm produces a sudden increase in intra abdominal pressure, which in cases of severe coughing or vomiting has been found to reach as high as 150 cm of *water*[6a] *In cases of strenuous coughing* or vomiting we find this combination of thoracoabdominal muscular contraction and increased intra abdominal pressure The greater the muscular development and the more healthy the subject, the greater will be the strength of the forces exerted In the stocky, barrel chested person the *greatest strain is on the upper third of* the incision, whereas in the obese patient *the pressure of increased* intra-abdominal tension is often the greatest factor, and the separation will often occur in the middle or lower third of the wound These severe a[illegible] [illegible]olen[illegible] [illegible]scular reactions are

TABLE 1.—*Height-Weight Relation and Predisposing Influences*

Patient	Age	Height	Weight	Postoperative Day of Disruption	Predisposing Post-operative Complication
1	50	5'7	157	7th	Severe coughing
2	46	5'6	188	4th	Ileus, vomiting
3	59	5'1	146	8th	Small bowel obstruction Vomiting
4	68	5'7	187	6th	Ileus
5	53	6'	162	8th	Coughing
6	60	5'6	176	7th	Coughing
7	59	5'6	143	9th	Ileus, vomiting
8	60	5'6	155	8th	Persistent hiccoughing
9	59	5'3	155	4th	Severe coughing
10	46	5'10	183	8th	Coughing
11	68	5'4	150	3d	Coughing
12	68	5'6	140	3d	Stomach distention Vomiting
13	48	5'8	190	7th	Severe coughing

TABLE 2.—*Protein and Hemoglobin Values*

	Admission		Preoperative		Second Postoperative Day		Within 48 Hours of Dehiscence	
Patient	Prot.	Hb.	Prot.	Hb.	Prot.	Hb.	Prot.	Hb.
1	7.1	98 %	7.1	98 %	6.4	87.1%	6.6	88.4%
2	6.5	99.5%	6.5	100.1%	6.6	91.1%	6.9	83.6%
3	6.3	100 %	6.3	100 %	6.7	100 %	6.1	87.8%
4	6.9	94.3%	6.6	108.6%	6.4	86.5%	7.3	67.6%
5	6.7	94.9%	7.3	97.5%	7.5	93 %	7.2	99.5%
6	5.4	83.2%	5.8	95 %	6.8	76.7%	6.4	83.2%
7	7.3	89.7%	7.2	90 %	6.0	81.9%	7.3	89.7%
8	7.2	94.9%	7.0	91.7%	6.1	109.9%	6.3	89.1%
9	6.9	93.0%	6.5	91.9%	6.0	78 %	6.1	77.3%
10	7.0	94.3%	7.0	85.8%	6.1	79.3%	6.1	66.3%
11	6.4	97.5%	6.6	95.0%	6.7	89.7%	6.5	80.6%
12	6.6	85.2%	6.8	91.1%	6.5	80.4%	6.5	80.4%
13	6.8	90.4%	7.1	91.0%	6.8	90.1%	6.2	85.8%

often accompanied by a sensation described by the patient as if "something in the wound had broken". In a few of our cases dehiscence did not occur suddenly, but it did take place after continuous and persistent sharp rises in tension due to prolonged hiccoughing.

Examination of the separated wound layers in each case revealed similar conditions. Invariably the wire sutures were found to have been torn through the disunited tissues. The knots were tied and the sutures were rarely found to have been broken. Little or no evidence of local wound necrosis was demonstrable Infection was not observed Of significance was the discovery of strong, well healed segments of united tissues above and be low the separated area In the majority of cases disruption took place in the upper third of the incision In a few par ticularly the obese patients, the dehiscence existed in the middle or lower third

The presence of a colostomy in the wound did not predispose to dehiscence Only 3 of the 13 patients had colostomies, whereas among the overall series there were 107 resections of the Miles type

Postoperative complications other than coughing, vomiting singultis and ileus were unusual in the group with wound dehiscence All were ambulatory early in convalescence, and as will be noted in Table 2, blood studies including hemoglobin and serum protein determinations (obtained routinely every two or three days in the postoperative period) gave results for the most part well within normal limits Indeed, among the group with wound disruption there were no serious nutritional problems either before or after operation, whereas in the overall series such problems were not uncommon In the patients suffering from medically intractable ulcerative colitis there were serious protein deficiences, especially in the postoperative periods, yet in this group we observed no dehiscences Of interest is the fact that all the dehiscences occurred in male patients, even though over one half of the total series were women We feel that this phenomenon can be explained by the relatively greater muscular development of the male as compared with that of the female

COMMENT

Stainless steel alloy wire has proved to be among the most satisfactory of all suture materials[3] It is unsurpassed in tensile strength and in its quality of being tolerated by the tissues without inflammatory reaction It is our opinion that in the weak, hypoproteinemic postoperative patient wire sutures maintain t

integrity of the wound remarkably well

Dehiscence in our group was entirely due to unusually high degrees of strain brought suddenly to bear upon the suture line The combination of intra-abdominal pressure and thoracoabdominal muscle tension caused the wire sutures to tear through the approximated wound tissues This event failed to occur in women or in patients debilitated through the effects of carcinoma, chronic ulcerative colitis or other disease It did not take place in tall, thin persons, and for the most part elderly patients escaped, as did patients with poorly developed musculature The stocky, well developed, healthy, barrel-chested middle-aged man was more prone to wound disruption than was any other type of patient

For further confirmation of our findings, in the last 200 consecutive resections of the large bowel or segments thereof care was taken to include larger bites of tissue with each wire suture, and in the patients who appeared predisposed to wound dehiscence (i e, the short, muscular type) retention sutures of No 30 steel alloy wire were used for additional strengthening of the wound In this series, dehiscence was reduced to 1 per cent

In the use of stainless steel alloy we recommend the employment of figure of-8 sutures placed 1 5 to 2 cm apart Fascia, muscle and peritoneum are united in the first loop, and the amount of tissue included must be generous The second bite includes only the fascial layers, but again the suture is placed far enough back to include a liberal portion of this tissue When the knot is tied tension is applied firmly enough to draw the layers together and place the first part of the knot without producing tissue strangulation Greater tension may be exerted after the second part of the square knot has been placed We have had several opportunities to recheck these sutures from within a few days to several weeks after wound approximation, and in no cases upon reopening the wound, were we able to discover tissue strangulation or necrosis In- ry reaction was absent wound healing was rapid. In the series of 515 cases the incidence of wound infection was less than 2 per cent.

SUMMARY

1. Postoperative wound dehiscence involving incisions closed primarily with sutures of stainless steel alloy wire is seldom due to hypoproteinemia, vitamin C depletion, anemia, old age, debilitation, the presence of cancer or other related causes.
2. In our experience the etiologic factor in 13 cases was increased intraperitoneal pressure combined with severe tension upon the wound brought about by sudden contracting of the thoracoabdominal musculature, such as might occur with vomiting or severe coughing.
3. The forces exerted upon the incision will be directly proportional to the muscular development of the patient and inversely proportional to postoperative debilitation.
4. Short, stocky, muscular persons seem to be able to exert greater degrees of strain on the paramedian abdominal wound than tall or thin persons.
5. The incidence of wound dehiscence was found to be decreased when larger portions of peritoneum fascia and muscle were included in the interrupted figure-of-8 sutures. No tissue strangulation will develop if the sutures are placed correctly and knots are tied without undue tension.
6. The use of wire retention sutures is recommended for selected patients, i.e., short, muscular, barrel-chested persons.

RÉSUMÉ

1. L'écartement post-opératoire d'une plaie fermée avec du fil d'acier inoxydable ne dépend pas habituellement d'hypoprotéinémie, d'avitaminose C, d'anémie, de sénilité, de débilité ou de transformation néoplasique ou de causes similaires.
2. Nous sommes d'avis que la cause fut, chez 13 patients, une augmentation de la pression intra-péritonéale associée à la pression élevée, sur la plaie survenant brusquement par une contraction des muscles thoraco-abdominaux, tel que dans le vomissement et la toux.
3. La pression exercée sur l'incision est en relation directe de la musculature du patient et indirecte avec sa débilité post-opératoire.
4. Les personnes de petite taille, trapues, musclées, semblent exercer une pression plus grande que lesmaigres et de taille élevée.
5. Laproportion d'écartement de la plaie est moindre selon la précaution de fermer la plaie avec du fascia péritonéal et musculaire et de faire des noeuds en 8 de chiffre. Il n'y aura pas d'étranglement si les joints sont bien placés sans y mettre trop de tension.
6. L'usage de points de soutien au fil de fer est recommandé chez un certain type de patients, v.g. trapu, musclé avec le thorax en tonneau.

RESUMEN

1. La dehiscencia postoperatoria de incisiones cerradas primariamente con suturas de alambre de aleación de acero inoxidable se debe a menudo a hipoproteinemia, deficiencia de vitamina C, anemia, vejez, debilitamiento, cáncer u otras causas que se mencionan.
2. El factor etiológico en 13 pacientes aumentó por presión intraperitoneal combinada con severa tensión sobre la herida por súbita contracción de la musculatura tóracoabdominal, como puede ocurrir con el vómito o fuerte tos.
3. Las fuerzas ejercidas sobre la incisión serán directamente proporcionales al desarrollo muscular del paciente e inversamente proporcionales al debilitamiento postoperatorio.
4. La musculatura parece ejercer mayor fuerza sobre la herida abdominal paramediana en las personas de tipo brevilíneo que en las de tipo longilíneo.
5. Se encontró que la incidencia de la dehiscencia postoperatoria es menor cuanto mayor es la inclusión de peritoneo, aponeurosis y músculo en las suturas interrumpidas en ocho (en equis). No

se producira ninguna estrangulacion tisular si las suturas se colocan correctamente y los nudos se hacen con la tension debida

6 Se recomienda el uso de suturas de tension en determinados pacientes, personas de tipo brevilineo

RIASSUNTO

1 Deiscenza della ferita postoperatoria cagionando incisioni chiusi primitivamente con suture di filo metallico non corrosivo e' raramente causata di ipoproteinemia, deplezione di Vitamina C, anemia, anziani, debilita', presenza di cancro o altre cause alleate

2 Nell'esperienza nostra il fattore eziologico in 13 pazienti era aumentato dalla pressione endoperitoneale combinato colla tensione severa sulla ferita compito dalla musculatura toraco addominale contrattante tutt'ad un tratto, come puo' avvenire nel vomito o nella tosse violenta

3 Le forze messo sull'incisione sara'direttamente proporzionale allo sviluppamento muscolare del paziente ed in proporzione inversa alla debilitazione postoperatoria

4 Persone corte, membrute, muscolari sembrano di potere esercitare piu' grande grado di forza sulla ferita addominale paramediana che alte o sottili

5 L'incidenza di deiscenza della ferita fu trovata diminuita quando piu' larghe porzioni di peritoneo fascia e muscolo erano inclusi nelle suture interotte figura di 8 strangolazione del tessuto non svilupperа' se le suture sono poste correttamente ed i nodi legate senza tensione eccessiva

6 L'impiego di suture di filo metallico ritentivo si raccomanda per pazienti scelte, vuol dire corti, muscolari, petto a barrile

SUMÁRIO

1 A deiscencia pos operatoria de suturas praticasas primariamente com fios de aco inocidavel e'raramente devida a hipoproteinemia, carencia de vitamina C, anemia, idade avancade, debilidade, presenca de cancer ou outras causas relatadas

2 Em nossa experiencia o fator etiologico em 13 pacientes foi agravado por pressao intra-peritonial combonado com severa tenäso sobre a ferida exercida por subitanea contratura dos numculos toraco abdominais, tal comio ocore nos oomitos e nos ataques de bosse

3 As forcas abuantes sobre a incisão podem ser diretamente proporcionais ao desenvolvimento muscular do doente e invarsamen te propoicionais a'debilidade pos operatoria

ZUSAMMENFASSUNG

1 Das postoperative Aufbrechen von Wunden, die primaer mit Drahtnaehten aus Legierungen von rostfreiem Stahl geschlossen wurden, erfolgt nur selten auf Grund von Eiweissarmut des Blutes, von Vitamin C-Mangel, Blutarmut, hohem Alter, allgemeiner Schwaechung, Anwesenheit von Krebs oder anderen verwandten Ursachen

2 Nach unserer Erfahrung spielte bei *dreizehn Kranken* die Kombination von erhoehtem intraperitonealem Druck mit starker durch ploetzliche Kontraktion der Brust- und Bauchmuskeln entstehende Anspannung der Wunde, wie es beim Erbrechen oder heftigem Husten vorkommen kann, eine wesentliche ursaechliche Rolle

3 Die auf die Wunde einwirkenden Kraefte stehen im direkten Verhaeltnis zur muskulaeren Entwicklung des Kranken und im umgekehrten Verhaeltnis zu seiner postoperativen Schwaechung

4 Kleine, gedrungene, muskulaere Menschen koennen anscheinend einen hoeheren Grad von Druck auf die paramediane Bauchwunde ausueben als grosse oder schlanke Personen

5 Es hat sich gezeigt, dass die Haeufigkeit des Aufbrechens von Wunden sinkt, wenn groessere Teile von Bauchfell, Faszie und Muskel in die unterbrochenen Achternaehte eingeschlossen werden Gewebsabschnuerungen sind nicht zu befuerchten, wenn die Naehte sorgfaeltig angelegt und die Knoten ohne uebertriebene Spannung gemacht werden

6 Die Anwendung von Dauernaehten Draht wird fuer eine bes

Gruppe von Kranken, naemlich untersetzte, muskulaere Individuen mit fassfoermigem Brustkorb empfohlen.

4. As pressoas musculo'sas, pequenas, abarracadas parocem possuir muior tolerancia a tensão exerada sobre incisses abdominais paramedianas do que os individuos altos ou franzinos.

5. Verificou-se que o imimero de deiscencias dimiminuiu quando grandes percões de fascia peritonial e musculos estavem incluidos. Nenhuma extraqulacão de tecidos ocorrerá si as suturas forem colocadas corretamente e os n'o's atados sem tensao.

6. O uso de suturas metalicas e recomendado para selecinados pacientes, como por exemplo, pessõas pequenas, musculósas, de torax em barril.

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The existence of great souls is not suspected. They hide away; all that is seen is a little originality. There are more great souls than one would think.

—*Stendhal*

A New Approach to the Heart in Cardiac Arrest

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EVERY paper on cardiac arrest emphasizes the sudden and terrifying aspects of the condition and the speed of action required of the surgeon to insure a successful outcome. The resulting cerebral anoxia causes irreversible brain damage in a matter of minutes. Bailey[1] mentioned a patient with irreparable cerebral damage after only one minute of cardiac arrest, while Thorek[2] reported a case of complete recovery after nineteen minutes of circulatory standstill. However, any period beyond three to four minutes is usually considered disastrous. Circulation of blood, with resultant cerebral oxygenation, begins immediately with the onset of effective cardiac massage associated with artificial respiration.

Among the factors which increase the lapse of time between the cessation of cardiac action and the onset of effective cardiac message is indecision on the part of the anesthetist and the surgeon. We are concerned here only with the part played by the surgeon. Fortunately for the average surgeon, he is confronted by cardiac arrest only at very rare intervals. He must make a quick decision on how best to massage the heart. Three methods of approach are now generally known. Thorek lists them as follows: (1) transperitoneal subdiaphragmatic; (2) transperitoneal transdiaphragmatic, and (3) transthoracic.

If operating in the abdomen, the average surgeon will impulsively try subdiaphragmatic massage. Although this is the easiest method, it is not often effective. Should this fail, the surgeon may either open the diaphragm or make a transthoracic incision in the left fourth or fifth interspace. The latter may require division of the fifth costal cartilage near the sternum to make more room for the hand, as recommended by Lahey.[3] These procedures increase the time consumed, because very few abdominal surgeons are sufficiently familiar with intrathoracic surgical methods to act without hesitation. A new approach, which would quickly lead the abdominal surgeon into the left side of the chest through familiar anatomic routes would eliminate procrastination.

Recently, when the necessity arose during a subtotal gastrectomy, such an approach, based on previous pertinent observations, was devised on the spur of the moment. The method is incredibly simple and rapid. It permits the introduction of the entire hand into the left pleural space and allows comprehensive palpation of the heart with most effective

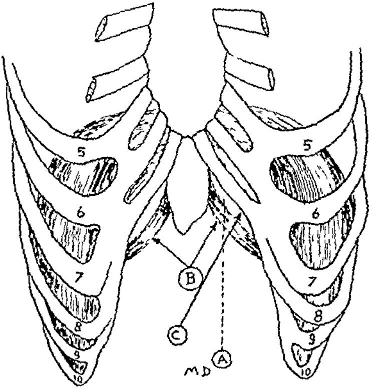

Fig. 1.—Diagrammatic representation of part of thoracic cage and diaphragm. Anterior slips of diaphragm are shown at *B*. A cut section of this tissue is seen in upper abdominal incision (see *A*). Diaphragm [illegible] unattached to costal [illegible] by C.

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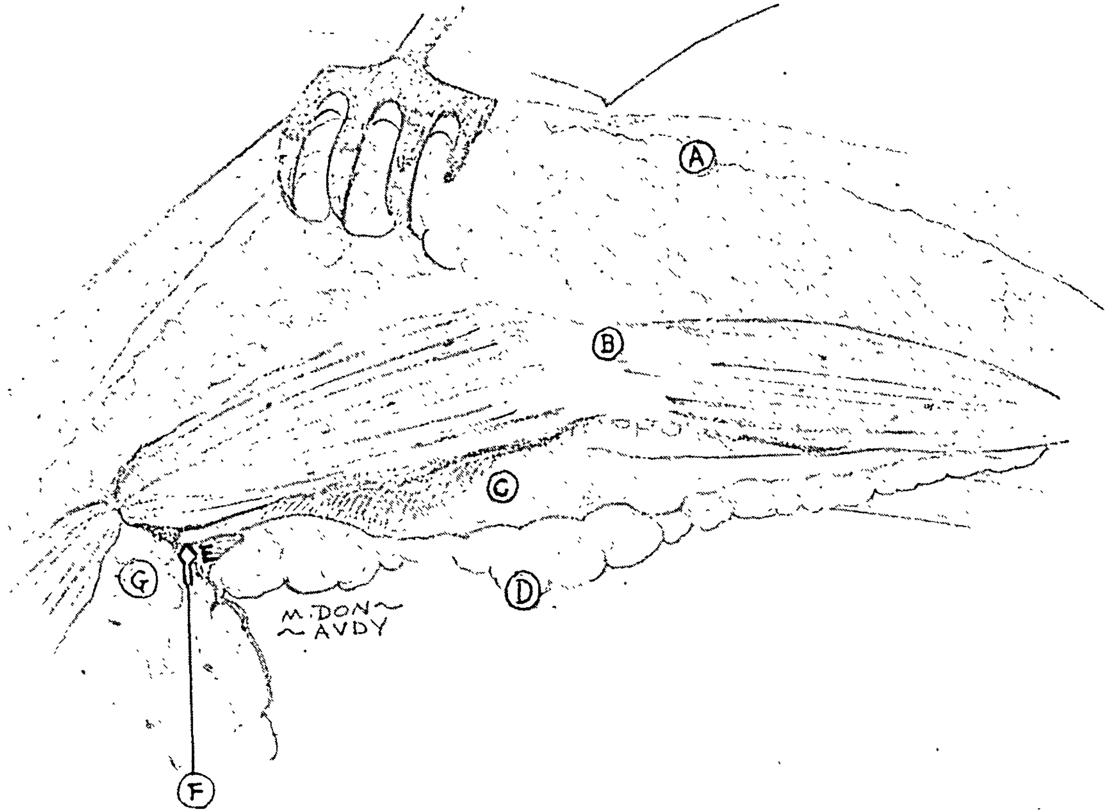
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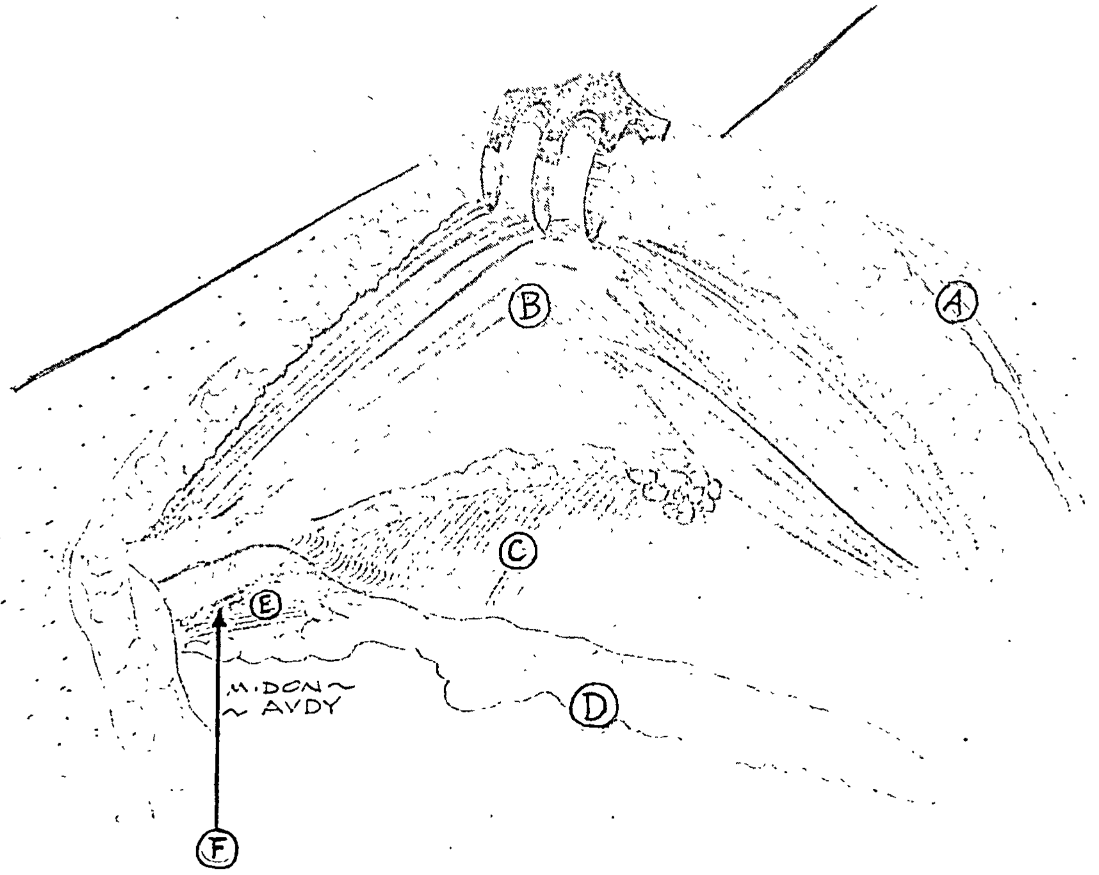
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massage Briefly, the method involves entering the left side of the chest by burrowing bluntly upward between the deep surface of the posterior rectus sheath and the anterior slip of the diaphragm in a region where the diaphragm is not attached to the costal arch Figure 1 shows the basis for this approach A longitudinal incision, as in *A*, cuts the anterior slip of the diaphragm, as in *B* The cut surface of this muscle tissue is visible in various lengths beneath the posterior rectus sheath and the transversus abdominus fibers in the upper end of the incision By inserting the fingers in the direction indicated by *C*, and burrowing behind the posterior rectus sheath and in front of the visible diaphragmatic muscle tissue, one enters the left side of the thoracic cavity without encountering any obstruction or causing any bleeding Upon entering the chest the fingers divide the junction of the parietal and diaphragmatic pleura, but one is hardly aware of this If the distance from the xiphoid to the point of origin of the diaphragm on the costal arch is too small to admit the hand, the attachments of the diaphragm can easily be separated to any desired distance without appreciable effort Figures 2 through 7 show various stages of this approach as performed on the cadaver The dissection is purposely extensive to help illustrate the procedure Figure 5 shows the extent to which the hand can be inserted, and in Figure 6 two ribs have been removed to show further the fullness and ease of cardiac massage Closure of the chest is automatic and simple (Fig 7) By suturing the peritoneum, the extraperitoneal fat, the transversalis fascia and the posterior rectus sheath as one layer in the usual manner, one seals the left side of the thoracic cavity at the same time Before the chest is closed one must see that the lung is fully inflated If an endotrachial tube is not already in *situ* the anesthetist should insert one with the onset of cardiac arrest This facilitates artificial respiration and later reinflation of the left lung Pneumothorax can be eliminated by inserting a catheter and aspirating the last of the intrapleural air as the pleural cavity is closed It is also possible to leave the catheter in and employ underwater drainage for two days That this is not usually necessary is shown by the portable chest film (Fig 8) taken the afternoon of the operation performed on the patient to be described It shows the left lung fully expanded, with no evidence of pneumothorax

REPORT OF CASE

A 62 year-old man was admitted to the South Side Hospital on Dec 18, 1950, for subtotal gastrectomy The patient had had a gastroenterostomy performed twenty years previously for a duodenal ulcer but was now having severe abdominal pain Roentgen studies showed a large ulcer, possibly malignant, on the lesser curvature of the stomach Laboratory studies revealed secondary anemia and hypoproteinemia These were corrected, and an operation was planned for 8 30 a m on December 22 Premedication consisted of morphine sulphate (gr 1/8) and scopolamine (gr 1/200) given one hour before the operation Anesthesia, begun at 8 15 a m, consisted of 1 per cent pontocaine (15 mg) with 2 1 cc of 10 per cent dextrose administered intraspinally and 0 2 per cent pentothal in physiologic solution of sodium chloride administered intravenously Nitrous oxide and oxygen were administered by inhalation Spinal anesthesia reached the fifth dorsal level at 8 30 a m Prior to anesthesia the blood pressure in millimeters of mercury was 115 systolic and 45 diastolic, the pulse was 100 and the respiratory rate 22 Five minutes after the operation was started the blood pressure had dropped to 80 systolic and 40 diastolic The pulse and respiration remained about the same A transfusion of whole blood was started

At approximately 9 55 a m, after the blood

Fig 2—View of incision indicated in Figure 1 *A*, skin and subcutaneous fat *B*, rectus muscle, *C* posterior rectus sheath with fibers of transversalis abdominus incorporated in upper third; *D* extraperitoneal fat and peritoneum, *E*, muscle fibers of anterior slip of diaphragm, *F*, r[illegible] of cleavage to be entered between *E* [illegible] *C*, [illegible] process

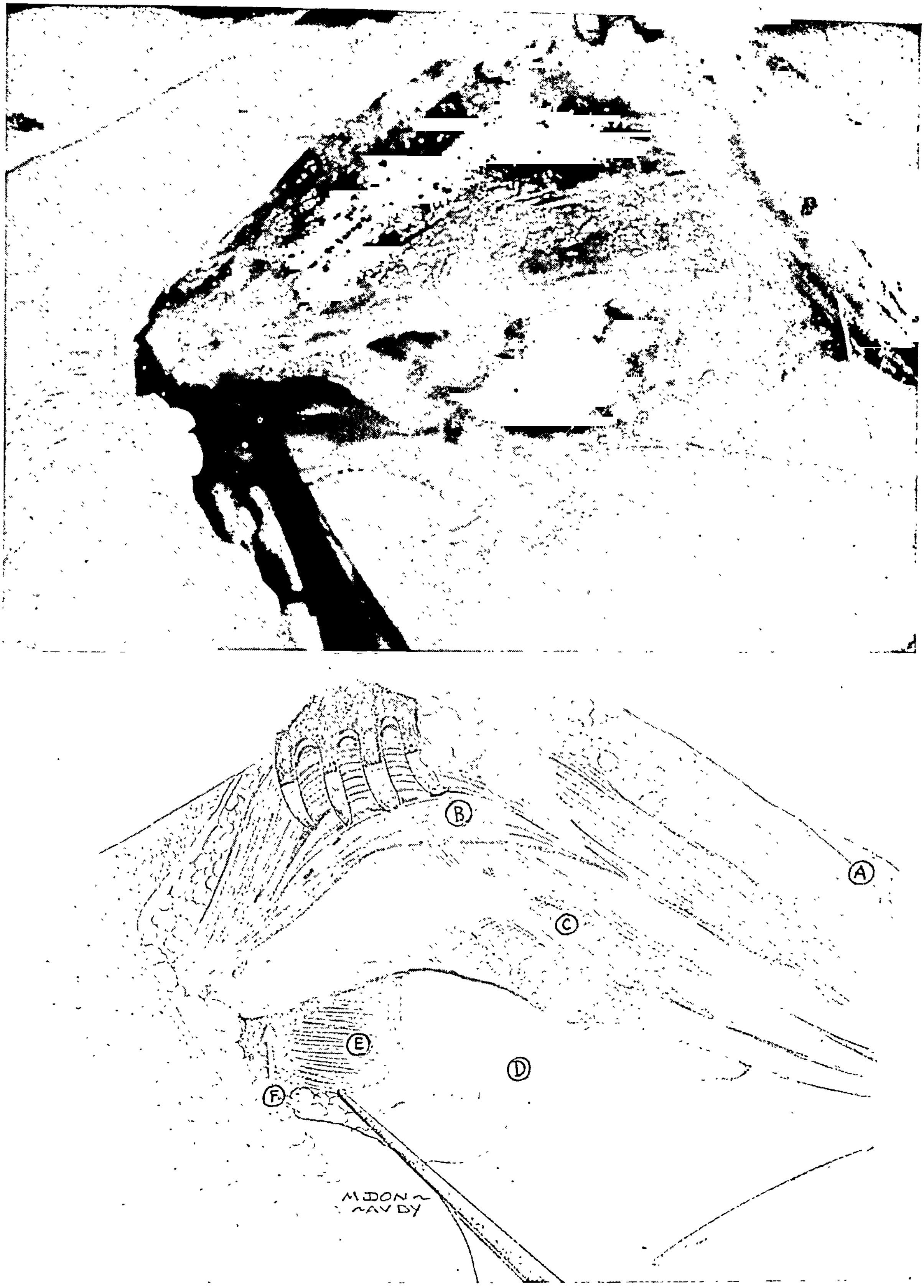


Fig. 3.—Further development of space to be entered between posterior rectus sheath (*C*) and fibers of diaphragm (*E*).

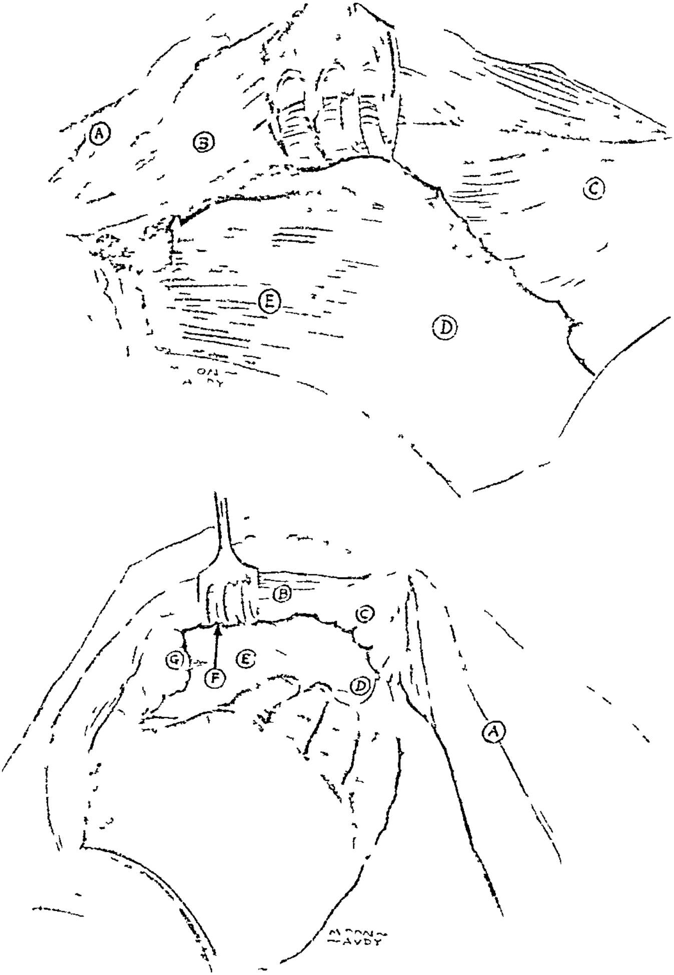
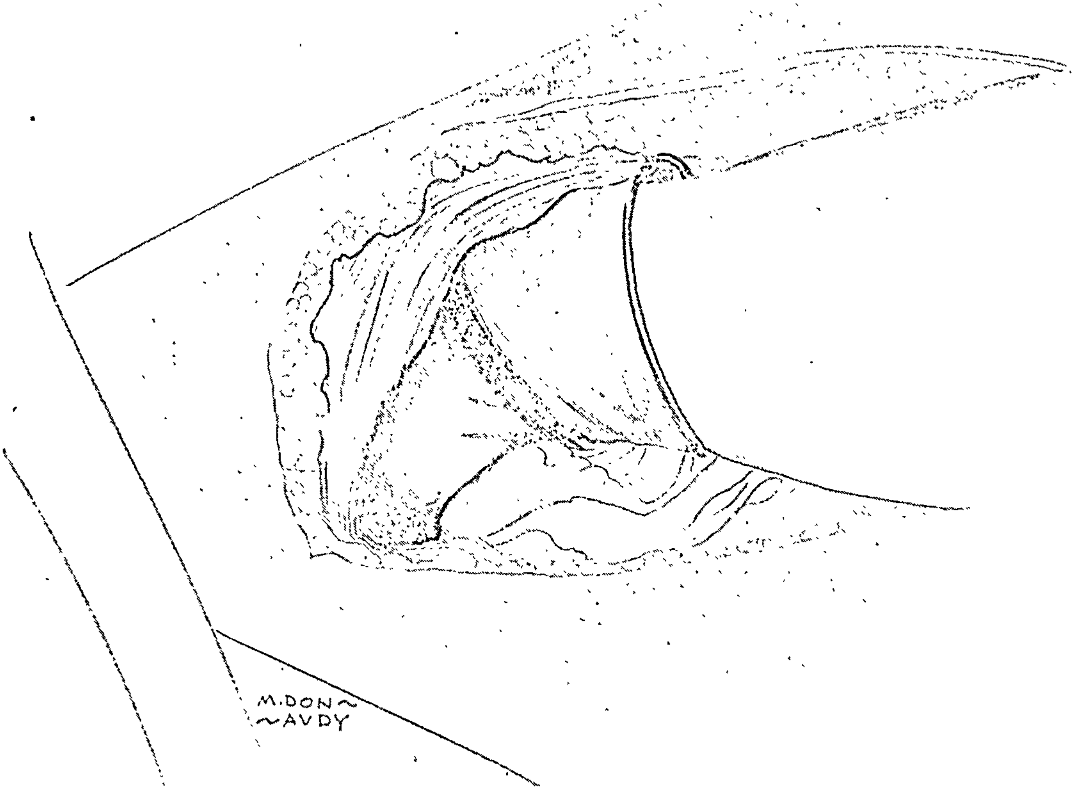


Fig 4—Stages in enlargement of opening into left ca (for purposes of illustration this
opening has been made ssary)



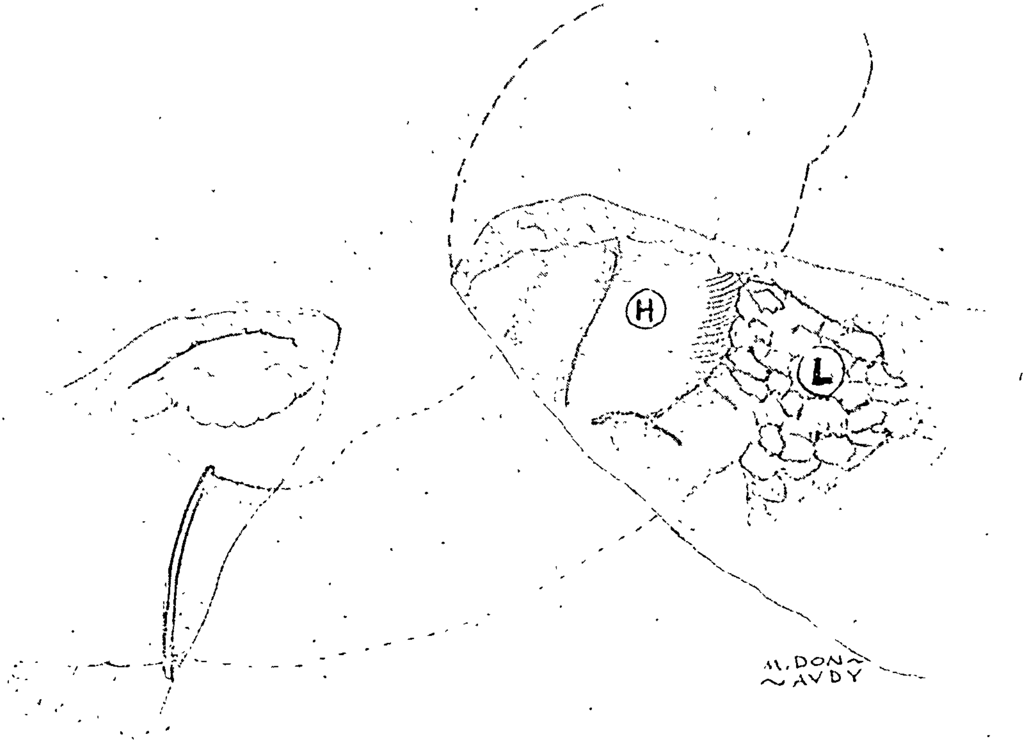


Fig. 5 (above).—Further stages in enlargement of opening into left pleural cavity (see Figure 4).
Fig. 6 (below).—Extent and ease with which hand can be inserted and heart massaged. Lower drawing represents heart (*H*) and lung (*L*).

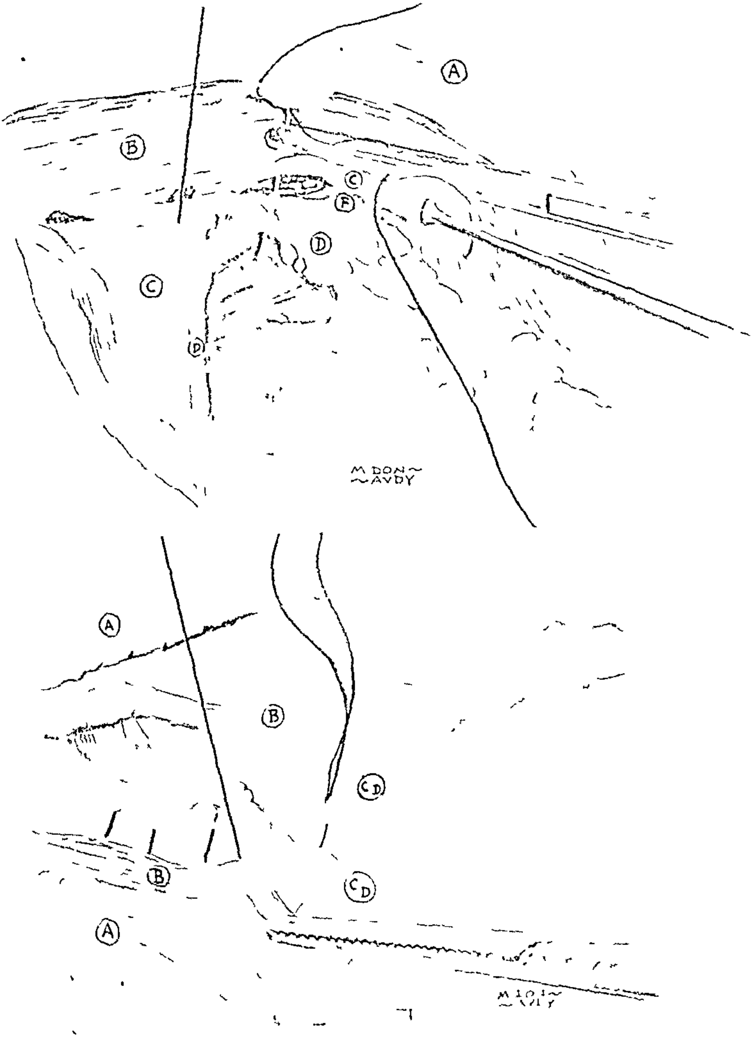


Fig 7.—Technic by which pleural cavity (*F*) is automatically closed by suturing peritoneum and extraperitoneal fat (*D*) together with transversalis an terior rectus sheath (*C*) as one layer in the nor e ,

pressure had dropped to 50 systolic and 35 diastolic, spontaneous respirations, which until that time had been occurring at the rate of 28 per minute, suddenly ceased. Controlled respiration with the administration of pure oxygen was instituted at once. Twenty mg. of vasoxyl were administered, 10 mg. intravenously and 10 mg. intramuscularly. The anesthetist, busy with the controlled respiration, was not sure when the cardiac arrest had occurred. He later estimated that the patient was probably pulseless for about five to ten minutes.

With the absence of cardiac contractions confirmed, the left pleural cavity was immediately opened in the manner described above. The heart was grasped with the right hand and massaged as rapidly as possible. Fibrillation occurred and was controlled by 100 mg. of procaine (1 per cent) administered intravenously. Spontaneous and regular cardiac contractions occurred after about five to seven minutes of massage. Epinephrine, 0.2 cc., diluted in 10 cc. of distilled water, was given intravenously to strengthen the contractions. The pulse became regular and of good quality, with a rate of 82 per minute. The blood pressure gradually rose to 125 systolic and 65 diastolic, only to fall later to 90 systolic and 60 diastolic. Although 1,000 cc. of whole blood had been administered by this time, an additional transfusion of 500 cc. was then started. The operation was completed and the abdomen closed after the left lung was completely reinflated. Controlled respiration was continued for at least one hour. Respiratory stimulants were given, and finally at 12:15 p.m. the patient was taken to his room with a blood pressure of 170 systolic and 80 diastolic, a pulse of 100 and a respiratory rate of 32. His general condition was poor. He was in coma and gave every evidence of severe cortical damage. Later that afternoon twitching of the left eyelid and arm began. At 5 p.m. a recurrent marked spastic tremor occurred over the entire body after any external stimulation. He occasionally blinked his eyelids. The pupils were equal and of normal size. There were no corneal reflexes. At 5:30 p.m., 60 cc. of normal salt-poor human serum albumin was administered intravenously as recommended by Seldon and his co-workers.[4] Immediately the patient became flaccid and all reflexes disappeared. During the next twenty-four hours an additional 300 cc. of serum albumin was administered without significant change in his condition. Other postoperative medication consisted of the continuation of oxygen and antibiotics, including penicillin, dihydrostreptomcin and repository heparin. Coma was persistent and the patient died. During the last eighteen hours the damage to the respiratory center manifested itself by a constantly decreasing respiratory rate until death ensued.

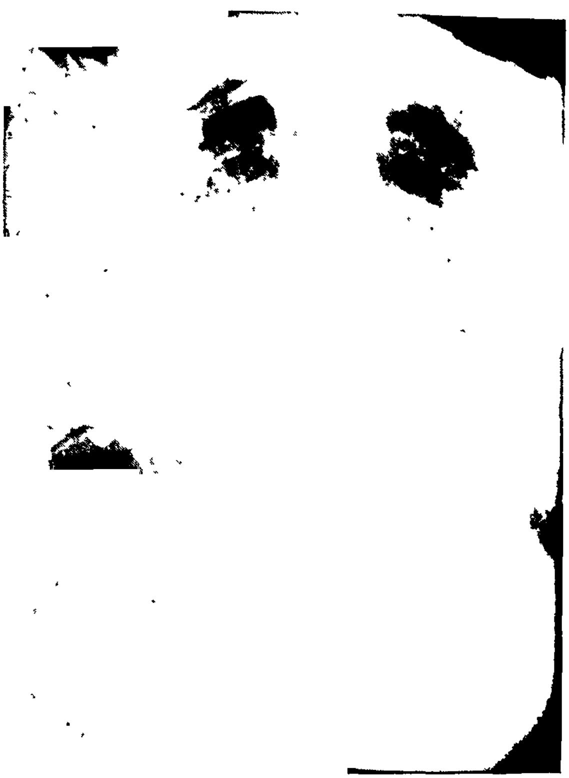


Fig. 8.—Portable chest film taken on afternoon of operation. Left lung fully expanded. No evidence of pneumothorax.

COMMENT

In spite of the fatal outcome of the case described, it is felt that the approach described is a valuable adjunct to the armamentarium of the general surgeon.

Although the left pleural cavity was entered in this case through a left upper paramedian incision, the method is applicable to almost any upper abdominal incision. By means of burrowing beneath the posterior rectus sheath in the direction of the left costal arch the surgeon will invariably enter the left side of the chest. In a case of cardiac arrest with the abdomen unopened, this technic is valuable as a primary method of approach because of the adequacy of the hiatus thus produced as compared with that of the intercostal incision. The peritoneum need not be opened.

SUMMARY

1. A new approach to the heart in cardiac arrest is presented.

2. Familiarity with this method should eliminate procrastination on the part of the average surgeon.

3. The method is simple and speedy and allows full hand massage of the heart.

4. Access to the heart is gained through a natural anatomic plane of cleavage, which eliminates the need to incise the diaphragm or the chest wall.

5. Closure is accomplished without additional suturing.

RÉSUMÉ

1. On rapporte ici une nouvelle méthode dans l'arrêt cardiaque.

2. Se familiariser avec méthode élimine toute temporisation de la part du chirurgien moyen.

3. Cette méthode simple et rapide permet le massage du coeur à pleines mains.

4. La voie d'accès au coeur se fait à travers un plan anatomique naturel de clivage, lequel élimine la nécessité d'inciser le diaphragme ou la paroi thoracique.

5. La fermeture se fait sans sutures surnuméraires.

ZUSAMMENFASSUNG

1. Es wird ein neuer Zugang zum Herzen in Faellen von Herzstillstand beschrieben.

2. Durch die Vertrautheit mit dieser Methode soll ein Zeitverlust seitens des durchschnittlichen Chirurgen ausgeschaltet werden.

3. Die Methode ist einfach und rasch und gestattet volle Handmassage des Herzens.

4. Der Zugang zum Herzen wird auf dem Wege natuerlicher anatomischer Furchen gewonnen, der die Durchschneidung des Zwerchfells oder der Brustwand unnoetig macht.

5. Die Schliessung erfolgt ohne zusaetzliche Naehte.

RESUMEN

1. Se presenta una nueva vía de acceso al corazón en detención cardíaca.

2. Habituarse a este método eliminará la dilación del cirujano ordinario.

3. El método es simple y rápido y facilitia ampliamente el masaje manual cardíaco.

4. El acceso al corazón se obtiene a través de un plano anatómico normal de despegamiento, lo que elimina la necesidad de la incisión diafragmática o de la pared toráxica.

5. El cierre se efectúa sin sutura adicional.

RIASSUNTO

1. Presenta un nuov'accesso al cuore nel arresto cardiaco.

2. Familiarita' con questo metodo dovrebbe sopprimere il chirurgo generale a procastinare.

3. Il metodo é semplice, rapido e permette massaggio del cuore a mano piena.

4. Accesso al cuore e' acquistato a parte della fessura superficie di anatomica naturale, coll'eliminazione dell'incisione al diaframma o alla parete toracica.

5. La chisura e' effetuata senza sutura addizionale.

SUMÁRIO

1. E' apresentada uma nova via de acesso ao coracão em casos de sincope cardiaca.

2. A familiaridade com este método poderá eliminar a procrãstinaco por parte da maioria dos cirurgiões.

3. O metodo é simples é rapido e permite empalmar o coracás para a massagem.

4. O acésso as coracão e'conseguido

pressure had dropped to 50 systolic and 35 diastolic, spontaneous respirations, which until that time had been occurring at the rate of 28 per minute, suddenly ceased. Controlled respiration with the administration of pure oxygen was instituted at once. Twenty mg. of vasoxyl were administered, 10 mg. intravenously and 10 mg. intramuscularly. The anesthetist, busy with the controlled respiration, was not sure when the cardiac arrest had occurred. He later estimated that the patient was probably pulseless for about five to ten minutes.

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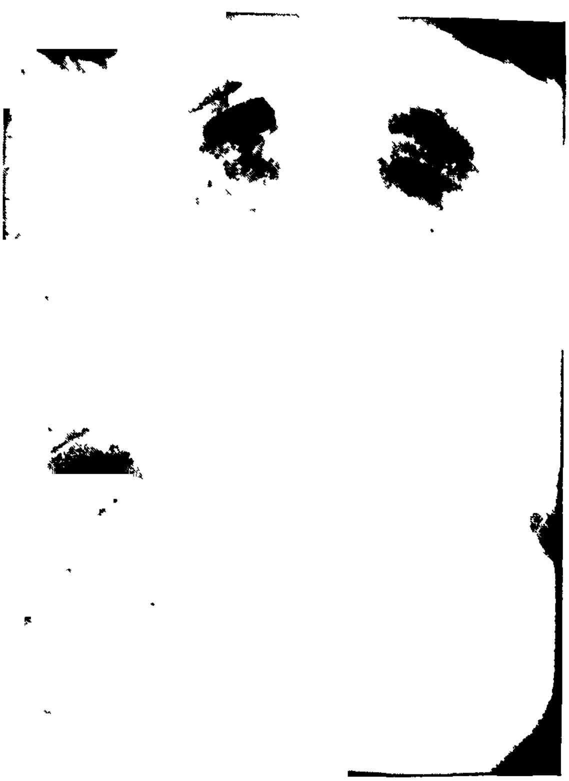

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Female Urinary Incontinence Due to Ectopic Ureter

E V CANNABRAVA MD FICS
ARAGUARI MINAS GERAIS BRAZIL

AS an introduction to this paper on urinary incontinence, I would like to call your attention to the plea on the same matter, directed to physicians throughout the world by Cristal and Greene from the Urological Department of the Mayo Clinic "We hope to stimulate the members of the medical profession to an awareness of this condition, which when properly treated, can be corrected in every case"

The purpose of this paper is to answer that appeal To my knowledge, this is the first case of extravesical ureteral opening ever reported in Brazil

I am strongly convinced that the supposed rarity of this abnormality all over the world is due chiefly to the infrequency of diagnosis

Reviewing the available statistics on the subject, one notes that the incidence of extravesical opening of the supernumerary ureter, formerly an autopsy observation, increases more and more as physicians become aware of this little known anomaly The following statistics corroborate this assertion, showing that the cases collected have increased from 100 to 300 in the last twenty years

In 1926 Kilbane reported 2 cases and, in a review of the literature, found 98 cases previously reported

In 1933 Hepburn, reporting 1 case, stated that until that time the aberrant ureter with extravesical opening had been reported 103 times In 1937 Campbell, emphasizing the rarity of this abnormality, wrote that 197 cases had then been reported, including 7 cases from the Mayo Clinic In 1938 Eisendrath collected a series of 255 cases In 1949 Langley, in England, reporting 1 case, cited Scott, who in 1944 estimated that there were approximately 300 cases on record

At the Mayo Clinic in 1937 I noticed on my first visit there, that they had handled and recorded 7 cases of ectopic ureter opening On my second visit, in 1946, that total had increased to 19

The history of urinary incontinence from birth, associated with otherwise normal urination, should lead one to suspect the presence of an extra vesical ureteral opening, but the condition is often undiagnosed even at large medical centers I shall illustrate this fact with 2 of many examples

First, a case was reported by Hepburn, in which a 25-year old woman entered the Hartford Hospital to be delivered of her third child Owing to her complaint of urinary incontinence, after the delivery she was taken to the urologic department, where they found investigation revealed a supernumerary ureteral opening in the vestibule That was a happy ending of a long, sad story, since the *woman had already given up all hope of* relief, she had already consulted several of the highest authorities, and her disability had never been discovered When she was 16, the report reads, her bladder was explored at a large New England hospital, without success At 19 she was under observation for two weeks at an excellent diagnostic center, where the urologists did not discover the cause of her incontinence It was nine years after her first consultation when the correct diagnosis was made and she was relieved of her disability

Second, a case was reported in 1940 by Greene and Ferrys from the Mayo Clinic, similar to the one just described the patient had been examined and treated by several physicians since she

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Read at the Seventh International Assembly of the International College of Surgeons Buenos Aires August 1950 atravéz de um plano anatomico natural de clivagem, o qual elimina a necessidade de incisar o diafragma ou as parêdes do borax.

5. O fechamento é executado sem sutúras adicionais.

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Echoes of the Past

X. "HIS HAIR TURNED WHITE"

Prematurely gray or white hair has been attributed to many and various causes. Ancient writers have indicted paroxyms of rage; unexpected and unwelcome news; diseases of the scalp; wounds of the head; habitual headache; excessive venery; mercurial poisoning, and anxiety. More recently, avitaminosis has been added to the list. But all these causes bring gradual effects. Sudden changing of the color of the hair is a different matter.

Because of its inherent drama, the idea has gathered a rich patina of legend down the centuries. Tradition says that during the reign of Charles V, about 1546, a young man was imprisoned for seduction and expected the death sentence. Brought before the judge after only one day of imprisonment, his face was ashen and his hair and beard as gray as those of an old man. The Emperor, moved by pity at this phenomenon, granted him a pardon.

The Memories of the Medical Society of London contain an account of a thirteen-year-old girl, the daughter of a clergyman, whose hair changed from black to white in one night. The Boston Medical and Surgical Journal of 1851 reports the case of a man thirty years old whose hair was "scared white" by an encounter with a bear. Both the beard and the hair of the Duke of Brunswick are said to have turned white in twenty-four hours after he heard that his father had been mortally wounded in the battle of Auerstadt. The hair of Marie Antoinette is also supposed to have whitened suddenly.

Popular belief has always associated this impressive change with mental depression or distraction. The German expression *"sich graue Haare etwas wachsen lassen"* (to worry oneself gray) arises from this foundation.

Many such accounts are fantastic and probably imaginary, but in some instances there is credible evidence of truth, and indeed the whole conception gains probability with the recognition and study of psychosomatic medicine. If emotion can produce functional disorders and physical complaints, why may it not cause sudden whitening of the hair?

—Bernard J. Ficarra, M.D., F.I.C.S.

She was about to be operated on for fistula when she decided to consult us for the first time Her history being strongly suggestive of an aberrant ureter with an extravesical opening, we *immediately considered the possibility* of that abnormality

Pelvic examination failed to disclose the ureteral opening in the vestibule An excretory urogram was made, and complete duplication of the left ureter was reported The left renal pelvis was sacciform The upper *part of the left kidney showed a concentrate* shadow and an aberrant ureter, partially visible at the second lumbar level and crossing the normal ureter close to the bladder There were moderate hydronephrosis of the right side and rotation of the right kidney Our suspicion confirmed, we repeated the examination, and, *after a long observation period*, a small drop of urine suddenly came out of a minute opening situated directly below the urethral orifice A ureteral catheter was introduced into this ureteral opening and 10 cc of uroselectan was injected in order to obtain a retrograde pyelogram The retrograde pyelogram revealed a *markedly dilated* supernumerary ureter running a tortuous course, from the upper segment of the left kidney to its end just below the normal urethral opening According to Weigert's law, which has exceptions, *the ectopic opening was draining the* upper part of the kidney The aberrant ureter presented in its lower part a slight narrowing An operation was advised and accepted, but had to be postponed twice because the patient's temperature was elevated, apparently from a urinary infection

Operation—*With the region under spinal* anesthesia, through an oblique flank incision, the left kidney was exposed, separated from the surrounding tissues and then freed and mobilized There were two ureters, one thickened and dilated, opening into the upper pole, the other apparently normal, ending into the *lower segment* The upper ureter was clamped and divided at a low level and the stump ligated The arterial supply was distinct to each segment of the kidney Upon freeing the renal vessel branch going to the upper pole, we obtained a better exposure and noticed a groove marking a distinct division between the segments of the two left kidneys

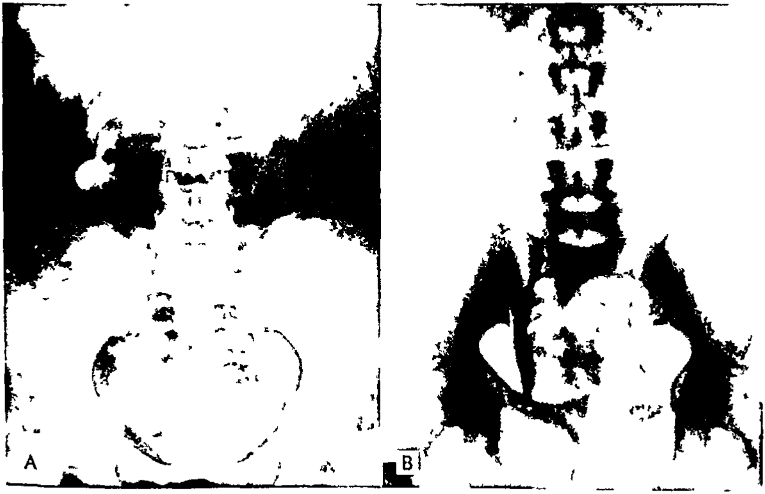

Fig 2—*A*, aberrant left ureter is suggested as partially visible at L 2 and crossing the left normal ureter close to the bladder *B*, retrograde urogram showing a dilated supernumerary ureter running a tortuous course and draining the upper portion of the left segment

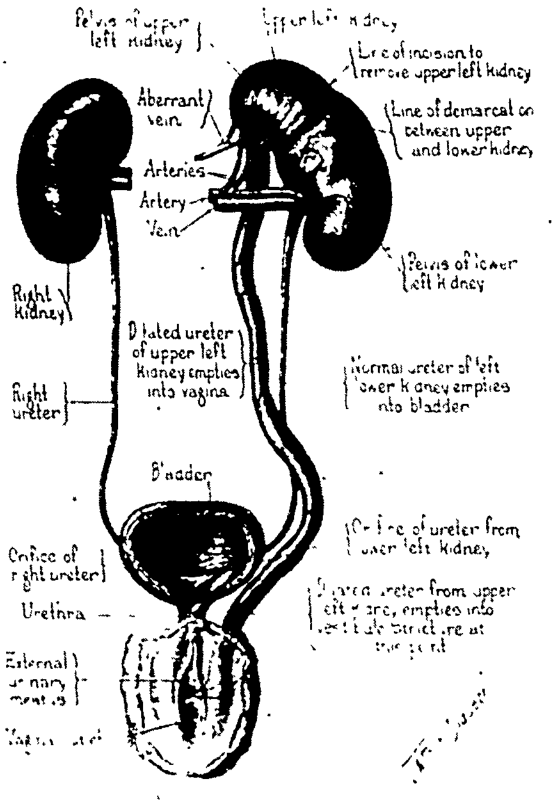
Pelvis of upper left kidney
Upper left kidney
Line of incision to remove upper left kidney
Aberrant vein
Line of demarcation between upper and lower kidney
Arteries
Artery
Vein
Pelvis of lower left kidney
Right kidney
Dilated ureter of upper left kidney empties into vagina
Normal ureter of left lower kidney empties into bladder
Right ureter
Bladder
Orifice of ureter from lower left kidney
Orifice of right ureter
Urethra
External urinary meatus

Fig. 1.—Sketch drawn by W. P. Didusch, from Hammet's material in a case similar to the author's.

was a child, and always unsuccessfully. In 1944, two years prior to admission, she had undergone a plastic operation for weakness of the vesical sphincter without benefit. Finally, in 1946 she was operated on with success, since her anomaly had been definitely identified.

The ectopic ureteral orifice is more frequent in female than in male patients, in the ratio of 2 to 1. The reason for this disproportion must be the fact that in the male the aberrant ureter opens distal to the vesical sphincter and is therefore practically symptomless. Kilbane, who collected 100 cases, noted 65 female and 35 male patients. Of the 65 patients only 9 were reported on from autopsy observations of the 35 male patients, 33, or almost all, were "postmortem cases."

Diagnosis.—Constant dribbling incontinence, present since infancy in spite of apparently normal urination, is the most important symptom of an ectopic ureteral opening.

Intravenous pyelographic study is a valuable diagnostic measure, although the aplastic supernumerary kidney usually is not able to concentrate the contrast medium and therefore shows the ectopic ureter faintly or not at all.

When the ectopic ureter ends in the urethra it is advisable to inject indigo-carmine into the bladder and then allow the patient to walk about wearing a pad. If the pad gets wet, but not discoloured, the presence of an ectopic orifice in the urethra is highly probable.

Careful pelvic examination with the patient in the lithotomy position during a long period usually discloses a bead of urine coming out of a slit in the mucosa, generally located in the vestibule and not far from the normal urethral orifice.

A ureteral catheter introduced into this slit permits one to take a retrograde pyelogram, the diagnostic value of which is far superior to that of an excretory urogram.

Treatment.—It is generally accepted that heminephrectomy is the procedure of choice. The ectopic ureter, owing to the infection always present, must be divided as far down as possible. If the vascular supply is not distinct to each kidney, nephrectomy must be considered. No attempt should be made toward ligation, implantation or anastomosis of ureters, since the accessory kidney pelvis and ureter are usually infected.

REPORT OF CASE

M.D., a well developed unmarried woman aged 20, complained of seepage of urine both nocturnal and diurnal. This annoyance had been present as long as she could remember; she was obliged always to wear a pad to protect her underclothing. The constant associated odor of urine reprived her of a normal life; she was shy and self-conscious, presenting an evident inferiority complex.

Her family and past history were irrelevant. She had consulted many physicians, and their diagnoses had varied between weakness of the vesical sphincter and vesicovaginal fistula.

She was about to be operated on for fistula when she decided to consult us for the first time. Her history being strongly suggestive of an aberrant ureter with an extravesical opening, we immediately considered the possibility of that abnormality.

Pelvic examination failed to disclose the ureteral opening in the vestibule. An excretory urogram was made, and complete duplication of the left ureter was reported. The left renal pelvis was sacciform. The upper part of the left kidney showed a concentrate shadow and an aberrant ureter, partially visible at the second lumbar level and crossing the normal ureter close to the bladder There were moderate hydronephrosis of the right side and rotation of the right kidney. Our suspicion confirmed, we repeated the examination, and, after a long observation period, a small drop of urine suddenly came out of a minute opening situated directly below the urethral orifice. A ureteral catheter was introduced into this ureteral opening and 10 cc. of uroselectan was injected in order to obtain a retrograde pyelogram. The retrograde pyelogram revealed a markedly dilated supernumerary ureter running a tortuous course, from the upper segment of the left kidney to its end just below the normal urethral opening. According to Weigert's law, which has exceptions, the ectopic opening was draining the upper part of the kidney. The aberrant ureter presented in its lower part a slight narrowing. An operation was advised and accepted, but had to be postponed twice because the patient's temperature was elevated, apparently from a urinary infection.

Operation.—With the region under spinal anesthesia, through an oblique flank incision, the left kidney was exposed, separated from the surrounding tissues and then freed and mobilized. There were two ureters; one thickened and dilated, opening into the upper pole, the other apparently normal, ending into the lower segment. The upper ureter was clamped and divided at a low level and the stump ligated. The arterial supply was distinct to each segment of the kidney. Upon freeing the renal vessel branch going to the upper pole, we obtained a better exposure and noticed a groove marking a distinct division between the segments of the two left kidneys.

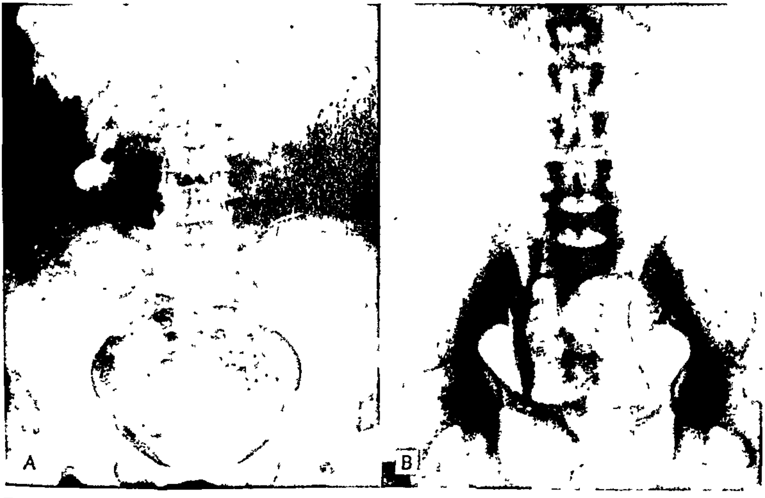

Fig. 2.—*A*, aberrant left ureter is suggested as partially visible at L 2 and crossing the left norma ureter close to the bladder. *B*, retrograde urogram showing a dilated supernumerary ureter runni a tortuous course and draining the upper portion of the left segment.

Dividing this line of demarcation, we excised the accessory kidney, which was about one fifth of the renal mass.

The postoperative course was uneventful, and the patient left the hospital in excellent condition. The urinary dribbling stopped entirely, and when the patient was last seen, four years after the operation, no incontinence had occurred.

Report on Pathologic Specimen by Dr. J. R. Meyer (S. Paulo).—"The specimen consists of a kidney 3 by 2 by 1.2 cm. The surface is irregularly lobulated. At the hilum there is a ureter 5 cm. long and 3 mm. in diameter. *Microscopic Examination:* Section of the supernumerary kidney shows normal parenchyma. Both glomeruli and convoluted tubes show normal structure. *Diagnosis:* Atrophic supernumerary kidney."

SUMMARY

The author reports a case of urinary incontinence in a young woman, due to ectopic ureter. He cites a plea made by David S. Cristal and Laurence F. Greene of the Urologic Department of the Mayo Clinic, urging physicians and surgeons to cultivate an awareness of this anomaly. He claims to be the first from Brazil to answer that appeal, since in his country this is the only case ever reported.

The author is convinced that the supposed rarity of this abnormality is due chiefly to lack of diagnosis. He reviews the statistics on the subject, which show that the reported cases of ectopic ureter increased from 100 to 300 in the last twenty years.

The author noticed on his first visit to the Mayo Clinic, in 1937, that they had recored 7 cases of ectopic ureter opening; on his second visit, in 1946, the total had gone up to 19. The author emphasizes that although the history of urinary incontinence existing in the female since birth, despite normal urination, should make one very suspicious of an ectopic ureter. There are many examples of failure to diagnose this condition even in the large medical centers of the United States.

The author's case, that of a woman aged 20 with a supernumerary left ureter opening in the vestibule, is reported. Heminephrectomy was performed and resulted in cure.

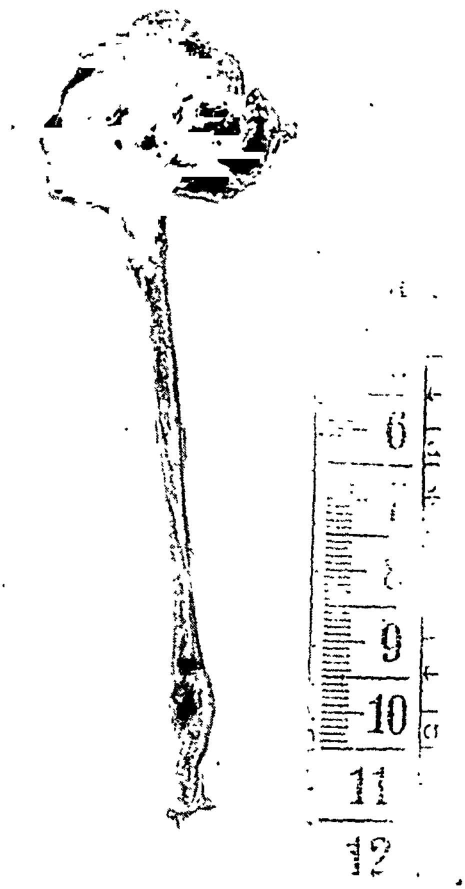

Fig. 3—Photograph of operative specimen (supernumerary kidney and ureter).

RÉSUMÉ

L'auteur, se rapportant á un cas d'incontinence urinaire provoquée par la presence de l'uretére supranumeraire avec abouchement extra-vesical, se refére, d'abord, a un appel fait par les docteurs David S. Cristal et Laurence S. Greene, du Département Urologique de Mayo Clinic au sujet d'une plus grande divulgation de la connaissance de l'anomalie dont il s'agit. L'ateur n'a trouvé au Brésil aucune référence á un cas identique. Il manifeste sa conviction que la rareté de cette anomalie est, en grande partie, subordonnée au manque de diagnostic, et, corroborant cetter affirmation, fait un révision des etatistiques publiés, demonstrent qui au cours des 20 derniéres annés, la casuistique a été portée de 100 a 300.

Cette augmentation doit être en consequence, non seulement de la plus grande divulgation entre les medicins de l'anomalie en question, mais, aussi de la plus grande généralisation d'examens radiologiques des voies urinaires.

L'ateur, ayant visité la Mayo Clinic á deux reprises, a observé lors de sa premiére visite, en 1937, que déjà 9 cas avaient été dans cette clinique, jusqu'a cette date, et á l'occasion de sa *seconde* visite, en 1946, le total des cas traités par la Clinique avait déjà atteint le chiffre de 19. Il appele l'attention sur la fréquence des erreurs de diagnostic relevées même jusque dans les grandes cliniques des Etas Unis. Enfin, l'auteur présente un cas de abouchement extra vesical de l'uretère chez la femme, présentent les symptômes typiques: incontinence d'urine continuelle s'accompagnant de mictions normales. Il s'agissait d'un petit troisième rein surnumèraire situé au pôle suprérieur du rein gauche avec un uretère très dilaté. La cure fut obtenue par la heminefrectomie.

ZUSAMMENFASSUNG

Der Autor berichtet ueber den Fall einer Frau mit Harninkontinenz, die durch einen aberrierenden Ureter verursacht war. Er bezieht sich hierbei auf die Bitte David S. Cristal's und Lawrence F. Greene's von der Urologischen Abteilung der Mayo-Klinik, derartigen Faellen Beachtung zu schenken. Der Verfasser fand in Brasilien keine anderweitige Mitteilung eines gleichen Falles.

Er gibt seiner Ueberzeugung Ausdruck, dass die scheinbare Seltenheit dieser Anomalie in hohem Masse durch mangelnde Diagnostik bedingt ist. Er stuetzt diese Meinung auf eine Untersuchung der veroeffentlichten Statistiken, welche zeigen, dass in den vergangenen zwanzig Jahren die Kasuistik sich von hundert auf dreihundert Faelle vermehrte. Dieses Anwachsen duerfte nicht nur die Folge der weiter verbreiteten Kenntniss des Krankheitsbildes sondern auch der allgemeineren Anwendung roentgenologischer Untersuchungen der Harnwege sein. Anlaesslich eines Besuches der Mayo-Klinik im Jahre 1937 beobachtete der Verfasser, dass bis dahin an dieser Klinik neun Faelle behandelt worden waren, waehrend er bei einem zweiten Besuche im Jahre 1946 feststellen konnte, dass die Zahl der Faelle, die die Klinik durchlaufen hatten, auf neunzehn angeWachsen war.

Er lenkt die Aufmerksamkeit auf die Haeufigkeit von Fehldiagnosen, sogar an grossen Kliniken der USA, obwohl doch die Harninkontinenz der Frau bei gleichzeitig normaler Miktion ein pathognomisches Charakteristikum eines ueberzaehligen Ureters mit extravesicaler Muendung ist.

Schliesslich referiert der Autor seinen Fall, wobei es sich um einen aberrierenden Ureter handelt, der aus einer ueberzaehligen Niere kleinsten Ausmasses entsprang und seinen Endpunkt in der Vulva hatte. Die Behandlung bestand in Heminephrektomie und fuehrte zur Heilung.

RESUMEN

Se comunica un caso de incontinencia urinaria por uréter ectópico en una mujer. Se cita lo dicho por David S. Cristal y Laurence F. Greene, Departamento Urológico de la Clínica Mayo, urgiendo a los médicos al despiste de esta anomalía. El autor reclama ser el primero en el Brasil en atender a este llamado, dado que en su país este es el único caso que hasta ahora se ha comunicado.

El autor está convencido de que la supuesta rareza de esta anormalidad se debe principalmente a la falta de diagnóstico. Revisa las estadísticas sobre el particular, las que indican un aumento de 100 a 300 de uréter ectópico en los últimos veinte años. En su primera visita a la Clínica Mayo en 1937, notó que se habían registrado hasta entonces 7 casos de abertura ureteral ectópica; en su segunda visita en 1946 el total de casos sumaba 19.

Se afirma que, aun cuando existan antecedentes de incontinencia urinaria en una mujer desde el nacimiento, a pesar de la emisión normal de orina,
pecharse un uréter ectópico, ten-

de los muchos ejemplos de falta de diagnóstico aun en los grandes centros médicos de los Estados Unidos.

Se da a conocer el caso de una mujer de 20 años de edad, con un uréter izquierdo supernumerario abierto en el vestíbulo. Se efectuó heminefrectomía y se obtuvo curación.

RIASSUNTO

L'A. riporta un caso di incontinenza orinaria causato da uretere ectopico. Cita la difesa fatto da David S. Cristal e Laurence F. Greene del dipartimento urologico della clinica Mayo, allegando i medici di aver conoscenza di quest'anomalia. Pretende di essere il primo da brasile di rispondere a quest'appello, dacche' nel suo paese questo e' l'unico caso mai riportato.

L'A.e' convinto che la supposita raritá di questa anormalita' sia debito alla mancanza di diagnosi. Passa in punto di vista i statistici sul soggetto, che dimostrano che i casi riportati del uretere ectopico hanno aumentato da 100a 300 negl'ultimi venti anni. Sulla prima visita alla clinica Mayo, net 1937, notava che avevano registrato 7 casi di ectopia ureterale; sulla seconda visita, net 1946, che il totale avanzo' a 19.

Si accentua' che, sebbene la storia d'incontinenza orinaria nella femmina da nascita, malgrado l'orinazione normale, dovrebbe fare sospettare un uretere ectopico, vi sono tanti esempi di mancanza di diagnosi pure nei grandi centri medicali degli Stati Umiti.

Riporta un caso di una donna eta' 20 anni con un uretere sinistro supernumario nel vestibolo. Eminefrectomia fu effettuato e risulto'in guarigione.

SUMÁRIO

O autor, relatando um caso de incontinencia urinaria provocada por ureter aberrante, refer-se, preliminarmente, a um apelo feito pelos Drs. D. Cristal e L. Greene do Departamento Urologico da Mayo Clinic, visando uma divulgação maior do conhecimento da referida anomalia. O autor não encontrou no Brasil nenhuma referencia a caso identico. Ele manifesta a sua convicção que a raridade desta anomalia é, em grande parte, condicionada á falta de diagnostico e, coraborando esta afirmativa, faz uma revisão das estatisticas publicadas, que demonstram que nestes últimos 20 anos a casuistica elevou-se de 100 para 300. Esta majoração deve ser consequente não só a maior divulgação entre os médicos da referida anomalia, como tambem a mair generalização de exames radiológicos das vias urinarias. O autor tendo visitado a Mayo Clinic duas vezes, observou na sua primeira visita, em 1937, que já haviam sido tratados naquela Clinica até aquela data 9 casos, e por ocasião de sua segunda visita em 1946, o total de casos passados pela Clinica já atingira a 19. Ele chama a atenção para a frequencia de erros de diagnostico, verificados até mesmo nas grandes Clinicas dos Estados Unidos, não obstante constituir a incontinencia urinária no sexo feminino, acompanhada de micção normal, um caracteristico patognomonico da presença do ureter extra numerario com abertura extra vesical. Finalmente, o autor apresenta o caso referente a sua comunicação, tratando-se de um ureter aberrante, drenando um rim extranumerario de diminuta dimensões, tendo o seu ponto terminal na vulva. Incontinencia urinaria, paradoxalmente acompanhada de micção normal e com a caracteristica de ser congenita: Heminefrectomia—Cura.

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A New Method for the Prevention of Anaphylactic Serum Reactions

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A GREAT number of methods have been described which aim at the avoidance of shock after the administration of serum. Yet none of these are entirely satisfactory. From time to time complications and even fatalities arise, which for obvious reasons are not always reported. In 1946-47 a discussion in the *Lancet* revealed no less than 3 deaths after serum injections, and in Israel several similar accidents have come to light.

The use of so-called "refined serums" is not altogether reliable, nor is the method of graduated injections, which is very time-consuming. It causes a delay of one to two hours, which may prove impracticable during mass inoculations in times of war.

Some forty years ago Besredka demonstrated that anaphylactic shock in animals could be suppressed by general anesthesia. His beautiful experiments remained forgotten until 1931. In that year my friend, the late Professor Moritz Katzenstein recommended that Bacillus coli serum be administered in large doses by intraperitoneal and intravenous injection for patients with peritonitis. I was then amazed to note how well the patients tolerated these enormous doses without suffering any reactions, until a fatality was reported from a well-known Berlin clinic after only 46 minims of intravenous serum had been given. The injection had been given before the operation, i.e., before the establishment of anesthesia. This seemed to me to be the key to the problem. I recalled Besredkas experiences and in the light of the aforementioned observation advised that the peritonitis serum should be given only during anesthesia at the end of the operation.

It appears that this advice has found general acceptance among surgeons, and nowadays, in operative cases of tetanus, gas gangrene, and B. coli infection, serums are given only while the patient is still anesthetized. As far as I am aware, no anaphylactic reactions have been observed during anesthesia.

I assumed that the stimulus in anaphylactic shock is conducted via the peripheral nerves to the central nervous system. This assumption finds support in a series of experiments performed by Froehlich. He showed that if homologous serum was dropped on the mesentery of a sensitized frog a local reaction resulted which was characterized by the swelling of nerve fibers. The swelling occurred only if the same species of serum was used as for sensitization; serum it did not occur with other proteins. It is therefore a visible expression of specific damage in anaphylaxis. The edema of the nerves regresses with the subsidence of the reaction.

I could cite further examples showing why a nervous pathway plays a part in the production of anaphylactic shock (e.g., the histamine weal with and without anesthesia, the iodine weal, etc.), but I shall no longer enlarge on this experimental evidence.

In pursuing the theory of nervous conduction to the central nervous system in anaphylactic shock, one would expect an omission of the reaction if the local pathway from the periphery were interrupted. To demonstrate this I performed a number of experiments on guinea pigs and rabbits. The animals were sensitized to foreign proteins, whic [illegible] njected with procaine

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anesthesia having been established. As I had expected, the reactions failed to occur, whereas control animals which had not received the procaine suffered the expected serious and sometimes fatal results.

Encouraged by these experiments, I transferred the method to human patients. In 1944 I published the results of five years experience, and to-day I am able to report on six further years. The later period includes the war years of 1947 and 1948 in Jerusalem, when vast numbers of wounded received antitetanus serum under cover of local anesthesia.

We used a 1 per cent procaine solution, with the addition of 14 minims of epinephrine per 100 milliliters. The amount depended on the volume of serum to be injected. As it is all-important that the serum depot should be everywhere surrounded by the procaine solution, the injection must be given in a manner similar to that used in preparation for the removal of a subcutaneous tumor with the region under local anesthesia. Five ml. of procaine solution suffices for 1 to 2 ml. of serum; for 5 ml., 10 to 20 ml. is required. For larger doses of serum, especially in infants, a 0.5 per cent solution of procaine with epinephrine is recommended to avoid damage by procaine. A longer interval must then be allowed to pass before anesthesia is established. The procaine needle may be kept in situ and used again for the administration of serum; this enables one to avoid a second needle puncture. This method results in a great saving of time as compared with the graduated injections, which require from one and one-half to two hours. Moreover, it appears to be absolutely reliable.

It seems reasonable to assume that anaphylactic reactions are suppressed while local anesthesia is effective. During this time small amounts of serum slowly enter the blood stream and act in a way similar to that observed after graduated injections. The advantage of the former method over the latter, however, lies in its speed. The addition of epinephrine may contribute further to the prevention of shock.

Only 1 example of anaphylactic reaction has been observed since this method has been applied. It occurred in a child. In this case only an insufficient amount of procaine had been given. But even here I feel confident that the use of local anesthesia actually saved the patient's life. The shock began only half an hour after the administration of serum and subsided with the aid of chloral hydrate and epinephrine.

SUMMARY

1. Guided by animal experiments (Besredka) the author advised in 1931 that injections of serums in operative cases be administered only while the patient was still under the influence of general anesthesia. This method has proved effective in preventing sensitivity reactions, and it is again recommended.

2. It is possible to avoid anaphylactic shock in experimental animals by means of local anesthesia. On the basis of these experiments, hundreds of serum injections have been given to human beings with the operative area under local anesthesia. A procaine-epinephine solution is employed. The serum depot must be fully surrounded by procaine solution and can be injected through the same needle within a few minutes of the procaine injection without risk of a reaction. This method has proved reliable and time-saving in an experience of eleven years.

RÉSUMÉ

1. Se basant sur des expériences sur des animaux (Besredka), l'auteur, dès 1931, recommande que les injections de sérum pour les opérés ne soient données que durant l'anesthésie générale. Cette méthode prévient des réactions de sensibilisation et est fortement recommandée.

2. On peut éviter un shock anaphylactique chez les animaux d'expérimentation par l'anesthésie locale. Se basant sur ces expériences, des centaines d'injections de sérum furent données à un patient, sous anesthésie locale, d'une solution de pro-

caine, épinephrine La masse du serum doit être entouree de la solution de procaine et peut être injectee par la même aiguille en dedans de quelques minutes sans provoquer de reaction Ce procede s'est avere certain et rapide pour une periode d'essai de onze annees

RESUMEN

1 De conformidad con la experimentacion animal (Besredka), el autor sugirio en 1931 que la administracion de sueros en casos operatorios fuera solamente cuanda aun el paciente se encuentra bajo anestesia general Se considera que el metodo se ha mostrado efectivo para prevenir reacciones de la sensibilidad y se recomienda de nuevo

2 Es posible evitar el choque anafilactivo con anestesia local en la experimentacion animal En virtud de esto, se han aplicado en el hombre cientos de inyecciones de suero con anestesia local, usando una solucion de procaina-epinefrina Debe rodearse ampliamente con la solucion anestesica la zona de la inyeccion de suero, que puede inyectarse por la misma aguja del anestesico unos cuantos minutos despues sin riesgo de reaccion El metodo se ha mostrado seguro y adecuado durante once años

ZUSAMMENFASSUNG

1 Auf Grund von Erfahrungen mit Tierexperimenten [Besredka] riet der Verfasser im Jahre 1931, Serumeinspritzungen in operativen Faellen nur zu verabfolgen, solange der Kranke sich noch unter dem Einfluss der Allgemeinnarkose befindet Diese Methode hat sich zur Vorbeugung von Ueberempfindlichkeitsreaktionen als wirksam erwiesen und wird aufs Neue empfohlen

2 Am Versuchstier gelingt es, das Auftreten eines anaphylaktischen Schocks mit Hilfe von Lokalanaesthesie zu vermeiden Auf Grund dieser Versuche sind am Menschen hunderte von Serumeinspritzungen unter Lokalanaesthesie, wobei eine Prokain- Epinephrin-Loesung zur Verwendung kam, gemacht worden Das Serumdepot muss voellig von der Prokainloesung umgeben sein und kann ohne Gefahr einer Reaktion innerhalb weniger Minuten nach dem Prokain durch die gleiche Kanuele eingespritzt werden Diese Methode hat sich in elfjaehriger Erfahrung als zuverlaessig und zeitsparend erwiesen

RIASSUNTO

1 Guidato da sperimenti su animali (Besredka), l'A consigliava nel 1931 che iniezioni di seri in casi operativi siano amministrate solamente mentre il paziente sia sotto l'influenza di anestesia generale Questo metodo ha provato efficace nel prevenire reazioni di sensitivita', e di nuovo e' raccomandato

2 E' possibile evitare shock anafillatico negli animali sperimentali per mezzo di anestesia locale Sulla base di questi sperimenti iniezioni di sero a centinaia sono state date in uomo sotto anestesia locale, usando una soluzione di procaina-epinefrina Il deposito di sero dev'essere pienamente circondato da soluzione di procaina e puo' essere iniettato a traverso il medesimo ago in poche minuti della procaina senza rischio di reazione Questo metodo ha provato degno di confidenza e compiacente nell'esperienza di undici anni.

SUMÁRIO

1 Baseado em experiencias em animais (Besredka) O autôr aconselhava em 1931 que as injecões de serums em casos operatorios fôssem somente praticadas emquanto o paciente estivesse ainda sob a influencia de anestezia geral Este metodo provou ser eficaz para prevenir reacões e e ainda recomendado

2 E possivel evitar o choque anafilavico em escperiencias em animais por meio do anestegia local Baseaudo-se nessas experiencias, centenas de injecões de serum foram aplicadas em pacientes humanos sob anestesia local, usando a procaina—solução de epinefrina O deposito de serum precisa ser inteiramente rodeado por solução de procaina e po ser injetado atravez ri

poucos minutos depois da procaina, sem risco de reacão. Este método tem a seu favôr uma experiencia de onze anos.

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Variations and mutations are the materials of the evolutionary process, and they occur in all possible directions; some of them are progressive, many are retrogressive, but only those that are fit survive. The present is apparently a period of great social, ethical, and religious mutation, and many of these are certainly retrogressive; but let us hope that the decent instincts and the common sense of mankind will see to it that these retrogressive mutations do no survive.

Whatever the ultimate basis of ethics may be, whether divine commands, intuitions and instincts, utility, or pleasure, the content remains essentially the same. However much codes and practices may change, our ideals and instincts remain much the same from age to age. Whether written on tables of stone or on the tables of our hearts, the "cardinal virtues" are still virtues and the "deadly sins" are still sins. The deepest instincts of human nature cry out for justice, truth, beauty, sympathy. Ethics that is based on pleasures of the highest and most enduring sort, on pleasures of the rational mind, the better instincts, refined senses, is not different from the ethics of the divine command to "lay up for yourselves treasures in heaven." These are "the enduring satisfactions of life." The new ethics of science does not essentially differ in content from the old ethics of revelation, and the commandments of a God within are no less binding than those of a God without.

Nevertheless, the decline of faith in the supernatural origin of man and of ethics, the decreasing fear of hell or hope of heaven, and the increased freedom of thought and action brought about by science and education have led, in some instances, to a general weakening of the ethical code. When increasing freedom carries with it an increasing sense of responsibility and duty it never endangers progress, but when liberty degenerates into license it marks the beginning of social and moral decay. Freedom is one of the principal goals of human endeavor, but the best use man can make of his freedom is to place limitations upon it. We can be safely freed from external restraints only in so far as we replace these by internal inhibitions.

—*Edwin Grant Conklin*

Recurrent Peptic Ulcer Following Surgical Intervention

Diagnostic and Therapeutic Problems

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THE addition of vagotomy to the surgical methods employed for the treatment of peptic ulcer has been a valuable contribution which has proved to be most useful in certain cases of anastomotic peptic ulceration. Unfortunately *neither gastric resection nor vagotomy* is followed by permanent cure in all cases. The diagnostic and therapeutic problems involved in such cases of recurrent peptic ulcer have become more complicated by the existence of various types of primary surgery which may have been employed as well as by the selection of the most suitable method of treatment after the diagnosis has been established. We shall discuss the problems encountered and the principles of treatment used in the management of 40 patients with anastomotic peptic ulcer who have been cared for during the four years between 1946 and 1950.

Anastomotic ulceration may occur whenever the intestinal continuity is altered so that gastric contents enter the small intestine without passing through the duodenum. The terms marginal, gastrojejunal *or jejunal ulcer* appear to be specific; however, by general usage, these terms may be considered synonymous with anastomotic ulcer. Such a lesion is usually located in the jejunum, opposite the gastroenterostomy stoma, often toward the distal loop. *However it may be* found on the jejunal side of the anastomosis, or rarely on the gastric portion. In *approximately 70 per cent of cases*, anastomotic ulcer develops within two years;[1] however, we have seen a case in which it occurred three weeks after operation, and a case has been reported thirty-eight years later.[2] Anastomotic ulcer is most likely to occur in young persons, although cases in both the very young and *very old have been reported.*[3]

Diagnosis. — Anastomotic ulceration should be suspected in any patient who is having abdominal discomfort following a gastrointestinal anastomosis, particularly if the previous operation was done for ulcer disease. Pain is the most frequent symptom, and, although this is usually more severe than in cases of duodenal or gastric ulcer, in an occasional case there may be only mild epigastric distress. The *pain is usually described as typical ulcer* pain, but of greater intensity and longer duration then usual. Food and alkalis usually bring relief, which, however, may be of short duration. The pain is usually to the left of the midline and slightly above the umbilicus. Nausea and vomiting may occur but usually are not predominating symptoms. Hemorrhage occurs in slightly less than 50 per cent of cases and most often appears as melena. Massive hemorrhage and hematemesis are unusual; anemia from chronic bleeding is more common. Obstruction of the anastomosis *and gastrojejunocolic fistula each occur* in about 10 per cent of cases. Perforation of an anastomotic ulcer is relatively rare, although we have recently seen 2 cases of this lesion.

Physical examination is noncontributory except for the presence of abdominal tenderness at the midline, or to the left of it. A mass may be palpable. '
be slight tenderness and rebo
ness.

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Careful roentgenologic examination is of the utmost importance. Although the diagnosis may be strongly suspected from the history and the results of physical examination, the positive diagnosis is most often made by the roentgenologist. Bockus[4] has stressed the importance of obtaining a postoperative roentgen study of all patients subjected to gastric surgical procedures before their discharge from the hospital. This serves as a control for comparison with further studies in the event that the patient has abdominal complaints at a later date. Only a small amount of barium should be given initially, for as more barium is given the jejunum quickly fills and obliterates the region of the stoma. Films taken two, three or four hours after a barium meal frequently demonstrate a crater which cannot be visualized until most of the barium progresses into the distal portion of the bowel. Repeated examination may be necessary, for on several occasions we have observed patients with early symptoms in whose cases the results of roentgenologic study were negative. A few weeks or a month later, however, a barium meal easily demonstrated a large anastomotic ulcer. Sometimes the only positive observation is stomal tenderness without a definite ulcer niche. It is also important to ascertain the patency of the stoma, for obstruction often indicates ulcer formation. In addition, the degree of stomal function may be a decisive factor in determining the operative procedure of choice.

A barium enema should be administered to patients with posterior anastomoses. The classic symptoms of gastrojejunocolic fistula, i.e., diarrhea, vomiting and weight loss, may not be present if only a small fistula exists. A gastrojejunocolic fistula is seldom visualized after a barium meal but may be easily demonstrated by a barium enema. It is important to detect the presence of such a fistula preoperatively, because a direct surgical attack is indicated. This will be discussed later.

The presence or absence of free hydrochloric acid in the stomach is often of definite diagnostic significance. We agree with the teaching of Palmer[5] that there will be no benign peptic ulceration unless the stomach is capable of secreting free acid. We have never encountered a case in which benign peptic ulcer, whether duodenal, gastric or anastomotic, occurred in a patient with consistent achlorhydria. Unfortunately, in most reported cases of so-called proved achlorhydria with benign ulcer the patients have been inadequately tested for the presence of free acid, or there has been inadequate proof of benign ulcer. In this respect there are several practical points to keep in mind. First, it is essential that the stomach tube is in the stomach and not through the gastroenterostomy stoma. This may be determined by fluoroscopic control or by the aspiration of clear, bile-free, gastric contents. Second, an adequate gastric test meal is necessary; histamine is used, for it is the most potent stimulant available. The recommended intramuscular dose of histamine diphosphate is 0.1 mg. per 10 Kg. of body weight. This, however, may be inadequate, particularly in cases of suspected anastomotic ulcer following high gastric resection. We have been using an initial dose of 1 mg. for all patients except those who are emaciated, and if this failed to produce free acid we have frequently given 1.2 mg. intramuscularly. In the absence of a response, a solution of 0.5 mg. of caffeine with sodium benzoate is instilled into the stomach, followed in half an hour by 1.2 mg. of histamine diphosphate administered intramuscularly.[6] This double stimulant has produced an acid response in a few cases in which histamine alone was not effective. Repeated tests are essential, because apparent achlorhydria may be only temporary.

Although the qualitative aspect of acid secretion is most important—that is, the question whether the stomach is capable of secreting free acid—a quantitative determination of acidity may be valuable. This applies particularly to patients who have undergone a simple gastrojejunostomy or an inadequate gastric resection, in whom the unstimulated gastric secretion, i.e., *the night secretion* or the basal secretion, is frequently elevated above normal. It should be emphasized, however, that excessive secretion of free acid is not necessary for the formation of an anastomotic ulcer, and that such an ulcer *may occur after high gastric resection* even though the stomach, after the most potent stimulation, secretes only a trace of free acid.

The insulin test may be of value if the patient has previously undergone vagotomy. Insulin hypoglycemia provokes increased gastric acidity and motility if vagus fibers are intact; thus a positive response *indicates incomplete vagotomy.* If a resected and vagotomized stomach has only a slight secretory response to 1 mg. of histamine diphosphate, a negative secretory response to insulin will be of no significance, for in general insulin *is a slightly* weaker stimulant than histamine. In such cases the vagus type of gastric motility may indicate incomplete *vagotomy. Although the percentages of recurrent* peptic ulceration following complete and incomplete vagotomy are not yet available, there is good evidence to indicate that the vast majority of such ulcers follow incomplete vagotomy.

The Palmer test[7] is useful in differentiating between ulcer pain and the pain of gastritis. A solution of 200 cc. of 0.5 per cent hydrochloric acid is *introduced* through a tube into the empty stomach. In the patient with an anastomotic ulcer this will usually produce immediate severe ulcer pain, which is quickly relieved by aspiration of the acid. This test may give positive results in patients with gastritis, *thus it* should be followed by the introduction of 0.36 per cent sodium bicar*bonate solution, which will not cause pain* in the ulcer patient but usually produces distress in a patient with gastritis.[8]

In most instances the anastomotic ulcer will not be demonstrated gastroscopically, owing to the usual jejunal location of the ulcer. True marginal ulcers or those on the gastric side may be visualized. Moderate gastritis, either generalized or stomal, is frequently observed in cases of anastomotic ulcer, but it must be remembered, and this is particularly true in alcoholic patients, that pain, vomiting and bleeding may be caused by gastritis alone.

Recently we have seen 3 patients with massive gastrointestinal hemorrhage in *whom anastomotic ulcer was strongly* suspected. The results of roentgenologic examination were equivocal, and there was definite achlorhydria in each case. Gastroscopic study revealed a small area of moderate hemorrhagic gastritis in 1 case and diffuse severe polypoid hemorrhagic gastritis in the other 2. Each patient previously had undergone complete *vagotomy for ulcer disease, and each had* consumed large quantities of alcoholic beverages. Owing to the severity of the hemorrhage and the uncertain diagnosis, each patient was reoperated upon, either a gastric resection or a resection being performed. *Anastomotic ulcer was not* found in the surgical specimen in any of the 3 cases; gastritis, however, was present, *which in 2 instances* was of a markedly hemorrhagic, polypoid type. Both patients had severe gastrointestinal hemorrhage a few weeks after the operation, but at the time of writing have been well for five to eight months after roentgen therapy to the stomach.

Treatment.—An anastomotic ulcer is more difficult to heal than either a gastric *or a duodenal ulcer, and more likely to* recur after healing has taken place. Ten *years ago* the surgical treatment of anastomotic ulcer was associated with a mortality rate of about 10 per cent; medical management, therefore, was usually recommended and surgical treatment attempted *only for the most intractable conditions.* Today, with the aid of chemo*therapy, antibiotics and blood transfusions,* as well as advances in surgical technic, anesthesia and postoperative care, the mortality is between 1 and 2 per cent. For these reasons, operation is now advised for all patients with anastomotic ulcer except those for whom a major operation is inadvisable because of other severe systemic

The selection of a surgical procedure in the treatment of an anastomotic ulcer, i.e., the question whether to employ gastric resection, reresection or vagotomy, depends upon many variable factors and must be selected for the individual case. In general, if adequate gastric resection has not been done previously, we feel that the procedure of choice is a high gastrectomy. Thus far, this is the best method of surgical treatment for peptic ulcer, and will remain so until more evidence is provided indicating that vagotomy (or some other procedure) is superior. However, there are certain indications for the use of vagotomy.

Vagotomy is definitely indicated for the treatment of anastomotic ulcer following an adequate gastrectomy, for the procedure is simpler, and the mortality and morbidity are lower, than after reresection or total gastrectomy. Either subtotal gastrectomy or vagotomy may be employed for the treatment of an anastomotic ulcer after an inadequate gastrectomy or a simple gastrojejunostomy. Although resection is generally the treatment of choice, for a "poor risk" patient or one with marked inflammatory reaction around the ulcer, the simpler procedure, i.e., vagotomy, may be indicated.

The location and function of the gastrojejunostomy stoma are important factors in determining the surgical therapy. If the stoma is functioning properly, vagotomy alone, either abdominal or thoracic, may be employed. On the other hand, if the stoma is partially or completely obstructed, vagotomy alone may be followed by severe gastric retention. In such a case, in addition to vagotomy, the old anastomosis can be removed and a new one created. Stomal obstruction in the case of simple gastrojejunostomy frequently is followed by reactivation of a duodenal ulcer, which may increase the difficulty of performing a gastrectomy. If the stoma is located posteriorly, gastrojejunocolic fistula should be suspected. The absence of roentgenologic evidence does not assure the surgeon that a fistula is not present. In addition, there may be severe inflammatory reaction of the transverse mesocolon, involving the bowel or its blood supply or both. For these reasons the colon is preoperatively prepared with antibiotics in every patient who has a posterior anastomosis. If a gastrojejunocolic fistula exists, a direct attack is indicated, with closure of the opening into the colon. In addition, either reresection or vagotomy should be employed.

Recurrent peptic ulcer, either duodenal or anastomotic, may occur after vagotomy. In such a case an accurate insulin test will usually demonstrate the presence of vagus function, indicating incomplete vagotomy. There is often still a choice between gastric resection and another vagotomy, and the general principles of therapy are the same as aforementioned. However, if a second vagotomy is decided upon, it is preferable to use the thoracic approach if the first vagotomy was abdominal, and vice versa. A second vagotomy, however, does not assure that all the vagus fibers will be severed, for there may be such marked anatomic variation that complete vagus section will be impossible.

Prophylaxis.—An important aspect of the study of anastomatic ulcer is prevention of such lesions by adherence to certain basic principles of gastric surgery. The performance of a simple gastrojejunostomy does little to alter gastric function. The secretory capacity of the stomach is unchanged, and the regurgitant neutralization is probably a negligible factor in ulcer healing. Healing of a duodenal ulcer takes place after gastrojejunostomy owing to the diversion of a portion of the gastric contents away from the ulcer-bearing area in the duodenum, and directly into the jejunum. This, however, also accounts for the appearance of a jejunal ulcer. Thus simple gastrojejunostomy is followed by an unfavorably high incidence of anastomotic ulceration, and its use in recent years has been suggested only for the aged patient with a high degree of pyloric obstruction and a low level of acidity. In such a patient there is no assurance that hyperacidity will not return after the obstruction has been relieved; therefore it is preferable to perform both a gastrojejunostomy and a vagotomy.

Adequate gastric resection is followed by a low rate of recurrent peptic ulceration. This is achieved by adherence to the three basic principles. First, a sufficiently large amount of gastric fundus must be removed. This means that a minimum of two-thirds and preferably three-fourths of the stomach must be resected. If only 50 per cent is removed, the remaining gastric pouch will often possess a large secretory capacity; thus, anastomotic ulcer is likely to occur. Second, the entire antrum must be removed. Although the antrum forms no free acid, it secretes gastrin, the gastric hormone which stimulates the acid-secreting cell in the fundus. If the entire antrum is not resected, the remaining gastrin mechanism may produce increased acid response even in a case of adequately high resection. Third, the length of the jejunal loop leading to the anastomosis should be as short as possible without causing any mechanical disturbance. It has been shown experimentally that the resistance of intestinal mucosa to acid-pepsin decreases progressively as the distance from the stomach increases.[9] Thus, in general, the greater the length of the proximal loop, the greater the possibility of a recurrent ulcer. This raises the question whether a "no loop" posterior anastomosis is preferable to a short loop anterior anastomosis. Actually, we have not seen a greater number of recurrent ulcers following anterior gastrojejunostomy when the loop is constructed just long enough to extend over the colon without tension. Enteroanastomosis diverts the alkaline duodenal contents away from the gastrojejunostomy and should not be employed.

Ample exposure is a necessity for the performance of an adequate gastric resection. A long, high right rectus or paramedian incision affords sufficient exposure for mobilization of the duodenal stump and in a thin patient also allows one to perform a high gastrectomy. Because this incision does not offer ample exposure in the heavy-set, squat or obese patient. Dr. Peter A. Rosi has recently suggested that for such persons a bilateral subcostal incision should be used. We have employed this incision in selected cases for the past two years and find that it offers excellent exposure both for duodenal closure and for the accomplishment of a high gastric resection.

Great care must be taken in the performance of a vagotomy to assure that as many vagus fibers as possible are transected. There are usually two main vagus trunks at the level of the diaphragm, whether the approach is from above or from below. However, we have seen histologic proof of eight nerve branches at this level. Even when great care is taken to sever all vagus fibers, there will be an incomplete vagotomy in at least 10 to 20 per cent of cases. Clinical evidence concerning the necessity of complete vagotomy is as yet inconclusive. Although the majority of recurrent peptic ulcers following vagotomy have occurred after incomplete vagus section, there are many patients who have had a good result for three or four years after incomplete vagotomy. Physiologically there is a possible explanation for this apparent inconsistency. We have retested 25 of our vagotomy patients three to four years after operation and find that they may be divided into three functional groups, as follows:[10] 1. No vagus function (complete vagotomy). 2. Partial vagus function. 3. Normal vagus function.

The best indication of vagus function, of course, is the insulin test, since an acid or motor response of the stomach to insulin hypoglycemia is positive evidence of incomplete vagotomy. In addition, any other evidence of unchanged secretory capacity is suggestive of incomplete vagotomy. Thus if the spontaneous secretion of the stomach, i.e., the night secretion or basal secretion, remains elevated, or if the postoperative response to histamine or caffeine is unchanged, we immediately suspect that functional vagus fibers are intact.

Patients with *no vagus function* consistently have no free acid response to insulin hypoglycemia and no free acid during periods of spontaneous secretion. In each case there is a reduced secretory capacity in response, to all stimuli, including histamine. In some instances there is absolute achlorhydria. There is also absence of the vagal type of motility. There is no evidence of any return of vagus function in this group, and these findings are persistent up to four years after vagotomy. The patients in this group, in general, have shown excellent clinical results.

Evidence of *partial vagus function* is provided by a slight acid or motor response to insulin hypoglycemia and often by free acid secretion of the unstimulated stomach. The results of the original postoperative insulin test in some of these cases were considered equivocal, whereas repeated tests over a period of years have offered definite proof of incomplete vagotomy. There is a slight return of gastric function in this group of patients three to four years after vagotomy, as has been shown by basal secretion studies. It should be emphasized, however, that in spite of this small increase over the early postoperative result, there is still a 66.2 per cent decrease as compared to the preoperative secretory rate, and there remains a 70 to 80 per cent decrease in response to histamine and caffeine in the late period as compared to the preoperative response.[10] Patients in this group have a so-called "incomplete vagotomy"; however, only *partial vagus function* is present with the marked persistent decrease in secretory capacity. Clinical results in this group have been generally good, but the period of follow-up is as yet insufficient to assure that this is permanent.

There is no indication of a change in gastric function or of any decrease in the secretory capacity of the stomach in patients with *normal vagus function.* Recurrent peptic ulcer has been common in this group.

A sufficient late clinical follow-up after vagotomy is not yet available to indicate accurately the recurrence rate of peptic ulcer; thus a fair comparison of this procedure with gastric resection cannot be made at present. Permanent good results probably can be expected in patients with no vagus function and partial vagus function in whom a markedly decreased secretory capacity persists three to four years after vagotomy.

SUMMARY

Diagnostic and therapeutic problems pertaining to the management of recurrent peptic ulcer following operation are discussed. The basic principles of adequate gastric surgery, which tend to prevent recurrent lesions, are stressed.

RÉSUMÉ

Discussion d'ulcères peptiques récidivant après opération on suggère les moyens de diagnostic et le problème du traitement. Discussion des principes fondamentaux de la chirurgie gastrique adéquate afin de prévenir les récidives.

RESUMEN

Se discute la tromboflebitis séptica del seno cavernoso y su pronóstico. Se citan casos ilustrativos de la Clínica Mayo. Se señala el tratamiento moderno y se presentan datos pertinentes en forma tabular.

ZUSAMMENFASSUNG

Die Verfasser beschreiben eine Methode der Kniegelenksversteifung durch Kompression und Fixierung mit Hilfe einer doppelten Drahtschlinge [No. 22] aus rostfreiem Stahl und von Knochenverstrebungen. Ein erlaeuternder Fall wird vorgestellt.

RIASSUNTO

Discutano probleme diagnostiche e terapeutiche appartenente al conducimento di ulcera peptica recidiva seguente chirurgia.

Riaffermano i principi di chirurgia gastrica *competente che contribuiscono a prevenire* lesione ricorrenti

SUMÁRIO

Problemas diagnosticos e terapeuticos concernentes ao manuseio da ulcera peptica recurrente posoperatoria são discutidos São salientados os pricipptos basicas *da cirurgia gastrica adequada para prevenir* lesões recurrentes

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“Milk of Calcium Gallbladder”

Report of a Case

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LOS ANGELES

IN November 1926, a medical report appeared in the *Munchener medizinische Wochenschrift* by Volkmann, describing a new pathologic entity, which was named “milk of calcium bile”. In 1911 Churchman described his observation of a pasty mass in a gallbladder which consisted largely of calcium salts. My report describes an additional case.

REPORT OF CASE

Mrs. V. H., a woman aged 59, had a typical history of pain in the right upper quadrant of the abdomen, usually one or two hours after meals, which radiated into the right scapular region; fullness after meals; bitter and sour eructations, and general abdominal distress caused by gas. Clinical examination revealed the patient to be well preserved and slightly obese. Physical examination gave essentially negative results except for dull pain on deep pressure in the gallbladder region. Disease of the gallbladder was suspected. A routine roentgenogram of the gallbladder was made by Dr. W. Bailey, and the following report was given:

A film of the entire abdomen made prior to ingestion of the gallbladder dye shows the gallbladder to lie to the right of the upper three lumbar vertebrae and to have extraordinary appearance. Almost the entire gallbladder is outlined by a dense white substance, in the midportion of which small radiolucent stones can be seen.

“In films made the morning after ingestion of the dye, it was seen to be in the hepatic flexure of the colon, but the shape of the gallbladder had changed hardly at all. Further examination made after the fatty meal showed the gallbladder to be slightly more lateral to the vertebrae, but again there had been no significant change.

“Incidentally, there is marked osteoarthritis of the lumbar portion of the spine.

“Conclusions: The data are indicative of ‘milk of calcium bile’, among which are distributed numerous small nonopaque stones. The ‘milk of calcium bile in this case is probably rather viscid, because the stones do not change appreciably in their relations to each other.”

Operation was performed. The gallbladder could not be emptied by manual pressure. The liver was of normal size and general appearance, though paler than normal. The gallbladder measured approximately 14 cm. in length and 4 cm. in diameter. It was greenish gray. The serosa was edematous and showed evidence of subacute inflammation. Numerous stones could be detected on palpation. The organ was markedly distended and under pressure. The omentum and transverse colon were adherent to the inferior surface of the gallbladder. There were no abnormalities in the stomach and duodenum.

The gallbladder was removed. There was no evidence of stones in the common duct. The bile, which flowed from the severed distal end of the cystic duct, was normal. The pathologist described the specimen as revealing that the gallbladder measured 14 cm. in length and 3.3 cm. in diameter at the fundus. It was distended with bile and contained a brownish-whitish tenacious mass in which many white flakes were suspended. There were numerous typical cholesterol stones. A hard stone, 3 mm. in diameter, was palpable in the cystic duct. About one-fourth of the content of the organ was bile mud. There were 16 hard spiculated stones measuring 2 to 5 mm. in diameter. The wall was edematous, with an average thickness of 2.3 mm. The lining showed flattening of the villi, which gave a less granular appearance than normal. The cystic duct was dilated and had a diameter of 1.1 cm.

The postoperative course was uneventful. Observation of the patient was continued. Five years ofter the operation a roentgen study showed an active duodenal ulcer. All symptoms subsided with conservative treatment. The serum calcium values were normal.

From the Surgical Division, St. Vincent's Hospital.
Submitted for publication Feb. 24, 1951.

At the last serum calcium determination in December 1950 the value was 9.4 mg

COMMENT

Some of the first German observers noticed during gastrointestinal roentgen studies, that the gallbladder was plainly visible. Those authors misinterpreted this visualization as a gallbladder filled by retrograde flow of barium into the biliary system. Later, pathologic study of the removed organ led to the correct diagnosis. Nearly all reports mention that there were stones wedged into the cystic duct. Some investigators claim that calcium carbonate in pure form exists in the gallbladder only if the cystic duct is nearly or completely obstructed. Naunyn held that calcium carbonate deposits originate probably from the gallbladder exudate, secreted with mucus from the wall of the gallbladder, and that they are not precipitated from the bile. This special type of mucus would require a certain intensity of mucosal inflammation of the gallbladder, and also a certain chronicity of the disease. There are only two other organs in the human body; the pancreas and the salivary glands, in the ducts of which concrements with a similarly high calcium carbonate content are found [illegible] of glands produce mucus.

Phemister's detailed and [illegible] dies reveal 2 patients in [illegible] calcium carbonate stone [illegible] gallbladder. In Phemister [illegible] is filtered through the [illegible] bladder into the bile [illegible] mucus and pus are [illegible] mucosal lining of the organ [illegible] experimental proof exists, however [illegible] mucosa or cholecystic [illegible] cium into bile. It is doubtful that the theory of a cystic duct stone with a ball-valve obstruction", in the presence of which bile may enter the gallbladder but cannot escape from it, is tenable. The proponent of this theory, Knutson, expressed the opinion that changes of absorptive and excretory function in the mucosa of the gallbladder are responsible for the precipitation of lime into the

Against this theory speaks the rather frequent occurrence of hydrops of the gallbladder, which is caused by obstruction of the cystic duct. The white bile contains little calcium carbonate. It also seems to me that the tone of the gallbladder muscles would outweigh the tone and force of the muscular walls of the biliary system.

A case has been described (*Freeman*) in which the gallbladder was filled with a typical putty-like tenacious mass. There were no stones, no bile and hardly any inflammatory microscopic changes in the cholecystic mucosa. In this case, Freeman subscribed to the possibility that barium given a few days previously might have entered the biliary tract.

European clinicians and pathologists thought that this high calcium content

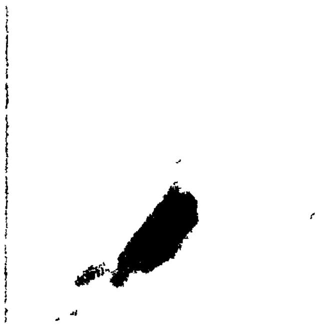

Fig. 1—Flat plate [illegible]

in the gallbladder might represent an interim state, which would eventually have led to the formation of calcium stones by precipitating calcium on preexisting cholesterol stones. Aschoff observed the formation of pure cholesterol stones in a medium which had a low protein concentration. Combined cholesterol calcium stones were found in an inflamed gallbladder which proved to have a rich protein content.

Normal bile contains roughly about twice as much calcium as is found in the blood serum, namely 20 mg. per hundred cubic centimeters. Maintenance of a proper proportion of cholesterin and bile salt acts to keep lime in suspension. Quantitative changes in the amount of either chemical compound could encourage precipitation of lime. Secondary contributory factors in the wall of the gallbladder, especially the mucosa, might lead to elimination of calcium from the pathologic bile in the gallbladder. Nearly all reports stress the fact that there was no change in the size of the gallbladder after a dye study, that a stone or stones were impacted in the cystic duct and that the gallbladder could not be emptied by pressure prior to its removal. In contrast to these reports, the size of the gallbladder in my case showed a very slight shrinking after the dye study and the stone in the cystic duct was slightly impacted, but not to such an extent as to cause pathologic changes or pressure necrosis in the mucosa of the duct. Mechanical emptying of the gallbladder in my patient prior to cholecystectomy was not possible.

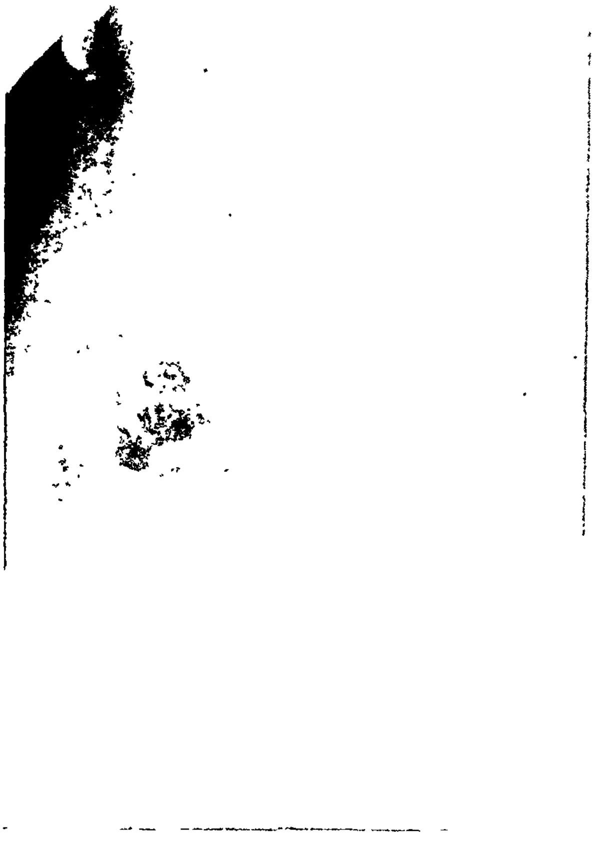

Fig. 2.—Gallbladder dye study one-half hour after fatty meal.

Cameron's interesting interpretation showed that bile and calcium carbonate deposits are found coexisting in the gallbladder and that obstruction in the cystic duct is not essential to the precipitation of calcium stones. Hultén's patient had treatment with calcium prior to the operation which showed the typical porridge-like thick whitish mass in the gallbladder. Hultén expressed the opinion that *occasional* high calcium content of the bile, combined with chronic prolonged inflammation of the gallbladder, is a possible contributory or causative factor in mass precipitation of calcium around cholesterin masses. Incidentally, his case is the first and only case I was able to find in the literature in which "milk of calcium" was found in the common duct.

The hydrogen ion concentration of liver bile is 8.2; that of the gallbladder ranges between 5.8 and 6.0. With addition of an acid medium to bile, precipitation of calcium is prevented and calcium stones cannot form. Inflammatory hypertrophic or atrophic changes in the mucosa and the wall of the gallbladder lead necessarily to absorptive and excretory changes of this organ, which renders the gallbladder bile more alkaline and more like liver bile, thus favoring the formation of calcium carbonate stones.

SUMMARY

A case of "milk of calcium bile" is described A correct preoperative diagnosis was made The gallbladder was filled with a brownish, whitish gelatinous mass, in which numerous white flakes and typical cholesterol stones were suspended

The etiologic background of this disease is not clear It seems that bile stasis, infectious conditions (especially of the biliary tract), certain bacterial toxins and metabolic changes are causative or contributory factors

RÉSUME

On decrit un cas de bile calcaire Le diagnostic pre operatoire ayant ete fait avec certitude La vesicule biliaire etait remplie par une maase gelatineuse d'un brun blanc, dans laquelle se trouvaient de nombreux flocons blancs de calculs de cholesterol en suspension

On ne connait pas clairement l'etiologie de cette maladie Il semblerait que, due a une stase biliaire, une infection des canaux biliaires, certaines toxines et un changement du metabolisme en seraient les causes contributives

RESUMEN

Se describe un caso de "bilis blanca" Se hizo diagnostico preoperatorio correcto El colecisto se encontro lleno de una masa gelatinosa blanquecina obscura, con numerosos copos blancos y piedras colesterinicas tipicas en suspension

El fondo etiologico de este padecimiento no es claro Se han señalado como factores contribuyentes o causales la estasis biliar, estados infecciosos (especialmente de las vias biliares), ciertas toxinas bacterianas y cambios metabolicos

ZUSAMMENFASSUNG

Es wird ein Fall von "Kalkmilchgalle" beschrieben Die richtige Diagnose war vor der Operation gestellt worden Die Gallenblase war mit einer braeunlich-weisslichen, gelatinoesen Masse, in welcher zahlreiche weisse Flocken und typische Cholesterinsteine schwammen gefuellt

Der aetiologische Hintergrund dieser Erkrankung ist nicht klar Es scheint, dass Gallenstauung, infektioese Veraenderungen [besonders der Gallenwege], gewisse Bakterientoxine und Stoffwechselveraenderungen ursaechliche oder beitragende Faktoren darstellen

RIASSUNTO

Descrive un caso di bile tipo "latte di calcio" un cui la diagnosi corretta fu fatta preoperatoria La cistifellea era piena d una massa gelatinoso bruno biancastra, nella quale erano sospesi gran numero di flocchi bianchi e tipiche pietre di colestrina

L eziologia di questa malattia e' oscura Sembra che ristagno di bile, stati infetti (specialmente delle vie biliari) certe tossine batteriche e ricambio basale sono fattori causativi e contribuenti

SUMÁRIO

Um caso de "leite de bile calcica" e descrito Um diagnostico pre'operatorio correto foi feito A vesicula biliar estava cheia de uma massa gelatinosa, esbranquicada, na qual numerosos floculos brancos e calculos tipicos de colesterol se encontravam suspensos

A etiologia desta doenca no e'clara Parece que a estase biliar, os estados infecciosos (especilmente do sistema biliar), certas toscinas bacterianas e alteracões metabolicas são fatôres causais ou contribuintes

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Aneurysm of the Celiac Artery

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BERGEON, in 1830, reported the first autopsy-proved case of aneurysm of the celiac artery According to the available literature, only 33 accepted cases of this unusual condition have been reported in over one hundred and twenty years In the case reported by Bergeon, the etiology was probably syphilis in that the patient presented signs of general paresis Later, in 1862, Concato presented the first case of celiac artery aneurysm to be diagnosed while the patient was living Again, the patient, a 38-year-old man, suffered from syphilis

Of the 33 cases so far reported, the condition in 8 (Archer, Aronssohn, Baccelli, Bergeon, Contanto, Laippy, Maunsell, Omodei-Zorini) was of proved syphilitic origin In 21 cases were the cause was unknown (Balme-Dugarray, Barthalow, Baynham, Bruen-Cleveland, Cutler (2 cases), Dowse, Federici, Grazradei, Heitz, Holmes, King-Fretz, Klob, LeVoy, Lewis, Lieutand, Lyman, McCarthy, Panizza, Salis Cohen) In 3 cases (Gorham, Omodei-Zorini, Sas) there was probably a traumatic origin The cases reported by the aforementioned workers were all true cases of celiac artery aneurysms, however, several false or spurious aneurysms of the celiac artery have been reported Tuberculosis accounted for false or spurious celiac aneurysm in 3 cases

Irvine reported an unusual and interesting case of spurious aneurysm of the celiac artery in which the patient was suffering from nephrolithiasis and pyelonephritis with extension of the inflammatory process throughout the adjacent retroperitoneal tissue This suppurative process caused partial destruction of the wall of the celiac artery, with resulting aneurysmal dilatation

Laippy, in his review of the literature, reported that 32 accepted cases of true celiac aneurysm had been recorded prior to the writing of his article in 1943 He reported the case of a Negro man, age 44, whose chief complaint was constant epigastric pain radiating laterally along both costal margins This symptom had persisted intermittently for over three years Increasing weakness, generalized muscular soreness, shortness of breath on exertion, and frequent chills were accompanying symptoms Perhaps the most interesting occurrence in this patient's sequence of symptoms was edema of the ankle and lower extremity, due probably to the compression of the inferior vena cava Vomiting of clotted blood and passage of bright red blood per rectum might well occur in association with a similar obstructive phenomenon In the hospital the patient continued to bleed and repeated transfusions were employed, but his condition became progressively worse, and on the eighteenth hospital day he vomited a large amount of blood, became comatose and died Autopsy revealed a syphilitic saccular aneurysm of the celiac artery measuring 15 by 7 by 4 cm An unusual feature was observed, in that a direct communication was noted between the main pancreatic duct and the aneurysmal sac Compression and partial obstruction of the second portion of the duodenum were also observed Indisputable gross and microscopic stigmas of syphilis were present in the thoracic and abdominal aorta In conclusion, Laippy stated that this case is the only instance of celiac artery aneurysm in 8,070 autopsies performed at the Institute of Pathology of Western Reserve University and University Hospital

It is of interest to note the case reported by LeVoy, in which the symptoms to a great extent were similar to complained of by the patient wh

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will be reported in this article. LeVoy stated that the symptoms were those of acute and chronic cholecystitis with accompanying vague gastrointestinal symptoms—nausea, an uncomfortable feeling of distress and fullness in the epigastrium. In LeVoy's case these symptoms persisted for about six months, after which time a sudden severe epigastric pain occurred, with radiation to the right shoulder. Nausea, slight jaundice and increased temperature were present. Death occurred suddenly six days after the initial severe epigastric pain. Autopsy revealed an aneurysm of the celiac artery which had ruptured into the lesser peritoneal cavity. The immediate cause of death was apparently a pulmonary embolism, the origin of which was presumed to be a thrombus in the inferior vena cava at the site of pressure from the aneurysm.

After considering the relatively few cases reported to date, it may be permissible to attempt to present this arteriopathic condition as a definite clinical entity. It must be kept in mind that, owing to the rarity of this condition, a positive and concise description is impossible; however, several relatively consistent facts can be recorded.

Etiologic Background.—This condition may be assumed to have its origin in one of the three following pathologic conditions:

1. Syphilis: In 8 of the series of 33 previously reported cases the condition was definitely proved to be of syphilitic origin. Since many of the cases were reported prior to the present-day high autopsy percentage, it may be fair to assume that several of the cases reported with the comment "cause unknown" could have fallen into the category of conditions arising from syphilis.

2. Trauma: In 3 cases the aneurysm was reported to be traumatic in origin. It is conceivable that the celiac artery, being relatively fixed in its position anterior to the vertebral column, could be traumatized by a crushing blow in the epigastric region.

3. Inflammation: One case was reported by Irving in which the inflammatory process present in an infected kidney, spreading through adjacent tissue to the celiac artery, caused sufficient destruction of the arterial wall to allow an aneurysm to develop.

Symptoms. — After a review of the limited literature available, it would seem that the most prevalent symptom complex is very similar to the commonly recognized symptoms of chronic cholecystitis. LeVoy's case was especially interesting in this respect. He stated that the symptoms complained of by his patient were those of acute and chronic cholecystitis associated with vague gastrointestinal symptoms of nausea and distress in the epigastrium. These symptoms have been recorded, with some variations, in several of the reported cases. In the case to be reported here, the symptoms were definitely those of acute and chronic cholecystitis. To this, however, must be added the fact that the patient did have cholecystic disease.

Gastrointestinal hemorrhage is another symptom that appears to have some definite place in the syndrome of this arteriopathic disease. Edema of the lower extremity, when associated with the other symptoms of this complex, may also be of some significance. This symptom could be due to pressure of the aneurysm on the inferior vena cava. Here again, unexplained embolic phenomena may raise the question of celiac artery aneurysm, especially in the presence of other associated symptoms.

Diagnosis. — Diagnosis of so rare an arteriopathic disease is hardly to be accomplished to a satisfying degree of accuracy; however, a few points of interest may at least be kept in mind: A patient with symptoms of acute and/or chronic cholecystitis associated with nausea, vomiting and other vague gastrointestinal symptoms, with edema of the extremities, rectal bleeding and/or severe hemorrhoidal enlargement, who has had unexplained and unprovoked embolic phenomena, may well be harboring this unusual condition.

CASE REPORT

M D, a white woman aged 60, entered the hospital on Aug 24, 1948, complaining of epigastric distress, nausea and vomiting Observation of the patient upon admission to the hospital revealed her to be rather pale and emaciated, although she was lying comfortably in bed and in no apparent distress

She stated that her last attack had occurred about two weeks before and was characterized by epigastric pain, which radiated laterally just under each costal border Nausea and the vomiting of brownish fluid accompanied it This attack gradually subsided, but a vague feeling of epigastric distress and anorexia remained

The history by systems gave negative results except for peristent and recurrent attacks of nausea, vomiting and epigastric distress

The past history revealed that the patient's first symptoms of "indigestion" and vomiting had began about three years before These attacks persisted with increased frequency until about one year before admission, at which time the vomiting became worse, with emesis of a brownish fluid There was no history of tarry stools or the vomiting of bright red material The patient's general health became progressively worse at the time of her admission to the hospital, she had lost considerable weight and was very weak

The family history was essentially noncontributory The father and mother were deceased (cause unknown) There was no family history of tuberculosis, diabetes or carcinoma in the family

Physical Examination —The blood pressure in millimeters of mercury was 146 systolic and 87 diastolic The pulse rate was 88 and the respiratory rate 18 The oral temperature was 97 6 F

Head The head was normal in size and contour

Ears The tympanic membranes were normal bilaterally There was a normal amount of cerumen in each external auditory canal

Eyes There was no extraocular infection Intraocular examination revealed signs of arteriosclerosis, otherwise the retinas were normal

Nose There was slight nasal mucosal injection, otherwise conditions were essentially normal

Throat No abnormality was noted The tonsils were present but atrophic

Teeth The patient was edentulous The gums were healthy

Lungs A few moist rales were noted throughout the bases of both lung fields The excursions were normal There was no tracheal deviation and no abnormality of the thoracic cage

Heart This organ was normal in size and shape The sounds were distinct, the second sound increased The blood pressure was 146 systolic and 87 diastolic The pulse rate was 88 The rhythm was regular

Abdomen The abdomen was scaphoid Tenderness was elicited in the epigastrium and in the right upper quadrant on pressure No masses were palpable The patient stated that pressure in the epigastrium caused pain to be transmitted to the back

Genitourinary Tract The external genitalia were normal for the patient's stated age Pelvic examination revealed senile atrophy of the uterus and adnexae

Skin There was dry senile atrophy, with lessened resilience and elasticity There was no icterus and no dermatitis

Neuromuscular System The reflexes were physiologic and the musculature well nourished

Laboratory Data —A blood count on August 24 revealed the following values red blood cells, 4,200,000 per cubic millimeter, with 10 Gm of hemoglobin, white blood cells, 5,200 per cubic millimeter, with 54 per cent segmental cells, 2 per cent band cells and 44 per cent lymphocytes The Mazzini test gave a negative result The observed sedimentation rate was 4 mm per hour, the hematocrit reading, 45, the corrected sedimentation rate, 6 mm A phelnolsulfonthalein test resulted in the following values at fifteen minutes, 115 ml, 32 per cent, at thirty minutes, 130 ml, 36 per cent, at one hour, 205 ml, 64 per cent

On August 26 the Mazzini test again gave a negative reaction Urinalysis was performed The urine was amber and cloudy, with a p_H of 5 The specific gravity was 1 012 There was a 1 plus reaction for sugar No acetone and no epithelial cells were present There were two or three casts, four or five pus cells, crystals, some amorphous, and many red blood cells

On the following day, August 27, urinalysis revealed the urine to be clear and yellow, with a p_H of 5 The specific gravity was 1 016 There were a few epithelial cells, occasional shreds of mucus, a slight trace of albumin and five or six pus cells. Tests for sugar and acetone gave negative results. A determination of the fasting gastric acid content revealed no free hydrochloric acid and a value for total acid content of 20 per cent. The forty-five minute specimen showed free hydrochloric acid 18 degrees and total acid content 38 degrees.

Survey Chest Examination; Examination of the Gastrointestinal Tract and Gallbladder.—Survey examination of the chest showed multiple calcific densities in the right subapex, indicating an old tuberculous infection. The remainder of the chest was not unusual for the patient's age.

Cholecystographic examination showed a satisfactory concentration of the contrast medium in the gallbladder. After a fatty meal there was almost 100 per cent emptying. A laminated stone 1.5 cm. in diameter was identified in the fundus of the gallbladder.

The gastric wall was soft and pliable except for an area immediately lateral to the cardium. In this area there was abnormal movement on respiration, and a persistent filling defect was noted. The external wall had a somewhat sawtoothed appearance. The rugal pattern was otherwise normal. Peristalsis was active, and there was no significant spasm at the pylorus. The duodenal bulb filled well and showed no deformity. At the end of four hours, approximately 10 per cent of the barium remained in the stomach. The head of the meal was in the ascending colon, and the small bowel pattern showed a moderate deficiency state.

Examination of the lower part of the gastrointestinal tract revealed no evidence of narrowing or obstruction. There was complete nonrotation of the cecum, which occupied its normal position of the hepatic flexure.

Conclusion.—It was concluded that the following conditions were present: (1) old inactive pulmonary tuberculosis; (2) cholelithiasis; (3) Distortion of the mucosal pattern in the fundus of the stomach, suggestive of a neoplastic lesion, and (4) nonrotation of the cecum. The tentative admitting diagnosis was chronic cholecystitis or gastric lesion.

Operation.—It was deemed advisable to explore the abdomen with the possible intention of performing a complete gastric resection.

With the patient under general anesthesia, the abdomen was opened through a transverse upper abdominal incision extending from the level of the ninth rib on the right rectus muscle was severed transversely, and a portion of the left rectus muscle was treated likewise. The peritoneal cavity was entered through this incision. The stomach was palpated and found to be markedly visceroptosed and located in a medial position. Palpation of the stomach revealed no pathologic condition. The lower part of the esophagus was normal. Posterior to the cardia on the aorta was a mass which was expansile with each heartbeat. This was determined to be an aneurysm of the celiac artery and thought to be the cause of the distortion seen in the roentgenogram at this level. The celiac axis lay directly posterior and slightly medial to the visceroptosed cardia of the stomach. Observation and palpation of the spleen revealed a recent infarct in its periphery. It was believed that a small thrombus had occurred in the aneurysm and then had been expelled through the splenic artery as an embolus to the spleen. A piece of omentum covered the infarcted area. The gallbladder revealed a large stone. The wall was indurated and showed signs of chronic inflammation. It was deemed wise to remove the gallbladder at this time. The gallbladder was removed in a retrograde manner after isolation and ligation of the cystic artery and cystic duct. A routine appendectomy was performed. No other intra-abdominal pathologic change was noted. A drain was placed in the foramen of Winslow and another along the gallbladder bed. The peritoneum was closed with No. 00 chromic catgut. The fascia was closed with the same material. The subcutaneous tissue was closed with No. 00 plain catgut. The skin was closed with dermal sutures.

Postoperative Diagnosis. — The diagnosis after operation was aneurysm of the celiac axis; infarct of the spleen; gastroptosis; cholecystitis (chronic), and choleithiasis.

Pathologic Report.—The specimen consisted of (1) a piece of omental tissue measuring 7 by 5 by 1 cm.; a portion of one surface was discolored; (2) a vermiform appendix 7 by 0.8 cm., with no gross lesion, and (3) a gallbladder with its largest measurement 6 cm. The wall was thin. The mucosa was bile stained.

Microscopic Section: Section of the gallbladder showed areas of mucosal atrophy and ulceration. Chronic inflammatory reaction was prominent (the section was such as to show multiple areas of mucosa, apparently nearly parallel with the wall in many places). Secmatory reaction of a nonspecific type. Section of the appendix showed essentially unaltered architecture.

Diagnosis.—The final diagnosis was chronic cholecystitis and subacute inflammatory reaction of omental tissues.

SUMMARY

An unusual case of aneurysm of the celiac artery is presented, together with a review of the literature on this subject. An attempt is made to classify this condition as a clinical entity, with full appreciation of the difficulties presented by the rarity of the condition and the lack of easily recognized signs and symptoms. The author hopes that the article may provoke enough interest in aneurysm of the celiac artery to keep surgeons alert to the possibility of its occurrence.

RÉSUMÉ

L'auteur espère sincèrement que cet article provoquera assez d'intérêt à cette artériopathie peu commune, afin que les autres soient sur le qui-vive à la possibilité de cette condition quand ils feront face à ses symptômes déconcertants et aux signes qui se rapportent à la pathologie de l'abdomen supérieur. Un essai de cataloguer cette activité comme une entité clinique a été fait avec la compréhension complète des difficultés présentes à cause de la rareté de cette condition et de la manque de symptômes et de signes physiques facilement reconnus.

Une condition insolite d'aneurisme de l'artère céliaque a été présentée aussi bien qu'une critique des écrits sur ce sujet.

RIASSUNTO

E la sincera speranza dell' autore che quest' articolo provochi abbastanza interesse in questa insolita arteriopatia da richiamare l'attenzione alla possibilità di questa condizione quando s'incontrono sintomi confusi e segni reguardanti la patologia dell'addome superiore. Si è fatto un tentativo di catalogare questa condizione come una entità clinica tenendo debito conto delle difficoltà che s'incontrono a causa della rarità di questa condizione e della mancanza di sintomi e segni fisici facilmente riconoscibili.

Si è così esposta una condizione insolita di aneurismo dell' artèria celiaca insieme ad un esame degli scritti su questo argomento.

RESUMEN

El autor espera sinceramente que esta escritura provoque bastante interés por esta arteriopatía rara, para que los otros sean sobre aviso a la posibilidad de esta condición cuando hacen frente a síntomas confusos y a indicaciones tocando a la patología del abdomen superior. Un ensayo de catalogar esta condición como una entidad clínica ha sido hecho con la comprensión completa de las dificultades presentes por la raredad de tal condición y por la falta de síntomas y de signos físicos fácilmente reconocidos.

Se ha presentado un estado insólito del aneurismo da la arteria celiaca, así como un exámen de los escritos sobre este tema.

ZUSAMMENFASSUNG

Es wird ein ungewoehnlicher Fall eines Aneurysmas der Arteria coeliaca beschrieben und ein Ueberblick ueber die einschlaegige Literatur gegeben. Es wird der Versuch gemacht, diese Erkrankung als klinische Einheit zu registrieren; die Schwierigkeiten, die dabei wegen der Seltenheit der Veraenderung und wegen des Fehlens leicht erkennbarer Symptome und Krankheitszeichen entstehen, werden voll gewuerdigt.

SUMÁRIO

Uma forma rara de aneurisma da arteria celiaca foi apresentada com revisão da literatura sobre o assunto. Foi feita uma tentabina de catalogar esta forma como uma [illegible], com ampla apreciacão [illegible] apresent[illegible] pela sua [illegible] de s[illegible] facilment[illegible]

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The business of philosophy is not so much to explain things as to find the things that explain themselves. This last is by far the more difficult operation of the two—at least it demands a higher order of genius. In our time we have grown so accustomed to approaching our problems through a fog of abstractions—such as "mind" and "matter," for example—that the thing which explains itself has become impossible to find. In many cases, indeed, the fog has reached such a point of density that philosophy, stuck fast in the midst of it, has come to the conclusion that the fog itself is the reality we are in search of. In Aristotle's time it was different. The fog-bank of abstractions was then no more than a light and transparent mist, through which the things that explain themselves could be readily seen—though even then, no doubt, the eye of genius was needed to see them. That it is that makes Greek philosophy, especially that of Plato and Aristotle, so profitable an exercise for our modern minds.

—*L. P. Jacks*

Incomplete Rotation of the Cecum with Volvulus of the Midgut

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CASE reports merit publication when they are of special or unusual interest. It is the purpose of this paper to present such a case. The communication deals with a 13-year-old boy who had incomplete rotation of the cecum with an associated volvulus of the small intestine which, in all likelihood, had existed since neonatal life. His general condition was good enough, however, so that the serious pathologic condition of the intestinal tract had not been suspected.

Intestinal obstruction, complete or partial, due to malrotation of the gut during fetal life, is an important condition observed in children of any age and occasionally in adults. The majority of the patients have sufficient symptoms to bring them to the surgeon in infancy. Symptoms may not appear until later or may not be severe enough to suggest surgical intervention.

In the largest series that we could find in the literature, 26 patients in the 44 cases reported were operated on during the first three weeks of life.[1] The oldest in this series was operated on at the age of 12 years.

Since in a number of asymptomatic cases this condition has been discovered at autopsy or routine roentgen examination, it is obvious that not all errors of rotation of the intestinal tract produce a sufficient degree of obstruction to attract attention. It is also plain that in many cases in which obstructive symptoms occur (mild or severe) the life of the patient is threatened unless surgical intervention is resorted to.

Ladd and Gross[1] observed that in most of the cases reported in the literature, of which there were more than 200, the diagnosis had been made at autopsy. In many of them the condition was discovered postmortem after unsuccessful surgical treatment.

Embryologic Considerations. — There are several types of malrotation, but in the great majority of cases the pathologic condition is concerned wholly with the development and position of the midgut (that portion of the alimentary tube extending from the distal end of the duodenum to the midportion of the transverse colon). This report deals only with this type. From the sixth to the tenth week of embryonic life the alimentary tube grows at a faster rate than does the peritoneal cavity. Thus a portion of the midgut is forced out to the base of the umbilical cord, becoming a physiologic umbilical hernia. At about the tenth week the peritoneal cavity grows at a greater rate, and the midgut is withdrawn into it. As it recedes into the abdomen it rotates in a counterclockwise direction (as one faces the fetus). Thus the caudad portion of the midgut (which includes the terminal ileum, cecum, ascending colon and right half of the transverse colon) lies wholly in the left side of the abdomen. The anticlockwise rotation continues until the cecum comes to lie in the superior part of the abdomen. As the rotation continues, the cecum passes into the right upper quadrant and finally comes to rest in the right lower quadrant. After this rotation is completed, the cecum and colon attain

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peritoneal reflections and attachments in the right side of the abdomen, and the mesentery of the small bowel likewise becomes attached to the posterior abdominal wall from the duodenojejunal juncture obliquely downward toward the cecum.

Pathologic Picture. — With incomplete rotation, the cecum is commonly found just below the stomach, with bands of reflected peritoneum running from the cecum or ascending colon to the right posterolateral part of the abdominal wall. These bands and folds, therefore, lie directly across the distal portion of the duodenum and partly obstruct this viscus by external pressure. Sometimes the cecum itself may lie over the duodenum and obstruct it. As a result of these abnormal positions of the intestines, the small bowel is anchored to the posterior abdominal wall by only a short mesenteric attachment instead of a normal long base from the duodenojejunal juncture to the right lower quadrant. Because of this, volvulus is very apt to occur, the twisting taking place around the rudimentary attachment of the mesentery and being usually in a clockwise direction. When such a volvulus occurs, two serious conditions are established; the twisting around the small mesenteric base angulates and obstructs the intestines at the duodenojejunal juncture and in the transverse colon; also there is partial or complete obstruction of the superior mesenteric vessels.

Clinical Picture.—In Infants: Vomiting is the chief complaint. The vomitus contains bile. Since the obstruction is usually partial, there may be some passage of curd-containing stools. Adominal distention is at first limited to the epigastrium; later, generalized distention may occur because of an associated midgut volvulus. Fever may occur either from dehydration or from infarction of a large part of the bowel because of volvulus.

In Older Children: There is usually a history of recurrent bouts of abdominal pain and vomiting. In the interim between attacks there may be no complaints. In some cases the condition is mistaken for "cyclic vomiting", psychogenic vomiting, food allergy, "intestinal grippe", etc. It is reported that a few patients present a clinical picture suggesting the celiac syndrome.

REPORT OF CASE

J. A., a white boy aged 13 years, was first seen by one of the authors on Aug. 15, 1949, at the office. The chief complaint was of recurrent bouts of vomiting and abdominal pain. The vomiting was said to have begun at the age of 1 week. The vomitus nearly always contained bile. There was occasional constipation. The baby was breast fed for several months. Various formulas were then tried, with no improvement. Food allergy had been suspected, but application of trial diets proved of no value. There was no family history of allergy. The family was questioned with the idea of ascertaining a psychogenic cause of the complaint, but there was nothing to suggest that this was a factor. There were no complaints between the episodes of vomiting except that the weight gain was poor. The attacks were said to last from one to three days and to occur every two to six weeks.

Physical Examination.—The boy weighed 70 pounds (31.8 Kg.). His height was 58 inches (147.3 cm.). His nutritional level was below normal. There was mild distention in the upper left abdominal quadrant; apparently no mass and no tenderness existed. The results of physical examination were otherwise normal.

Laboratory Data.—The erythrocyte count was 4,400,000 per cubic millimeter of blood; the leukocyte count was 8,500, with a normal differential count. The sedimentation rate was 10 mm. per hour (Westergren). Serologic tests gave negative results, as did a tuberculin test (1-1,000).

A barium meal study revealed a markedly dilated duodenum. There seemed to be a partial obstruction at the duodenojejunal juncture. A barium enema was not done.

Course.—Since it was apparent that the patient needed surgical relief, he was admitted to the Muhlenberg Hospital, Plainfield, New Jersey, on September 12. A gastrointestinal roentgen study revealed essentially the same conditions as have been noted. A barium enema was again omitted, since we felt that we were dealing with a pathologic condition in the upper gastrointestinal tract only. The surgical consultant reviewed the case and recommended that we perform a laparotomy after proper preparation of the patient The patient was now symptom free, and we felt that we could be deliberate in our preoperative treatment Consequently, the boy was discharged on September 15 with the operation scheduled for September 23

For one week prior to operation, 1 Gm of succinylsulfathiazole was administered every three hours, six doses a day, and for forty-eight hours before the operation streptomycin, 0 5 Gm, was given orally every eight hours A Jutte tube was placed in the stomach for forty-eight hours before the operation, and the patient was sustained by adequate administration of parenteral fluids This treatment was thought to be indicated because the surgical procedure might entail opening the bowel

During this time we had ample opportunity to search the literature for similar cases We were impressed by the similarity of our case with reported cases of malrotation of the gut A barium enema study might have been helpful in diagnosing such malrotation, but to perform one during the period of preoperative treatment would have been impractical Since the patient obviously needed surgical treatment anyway, it was decided to forego the

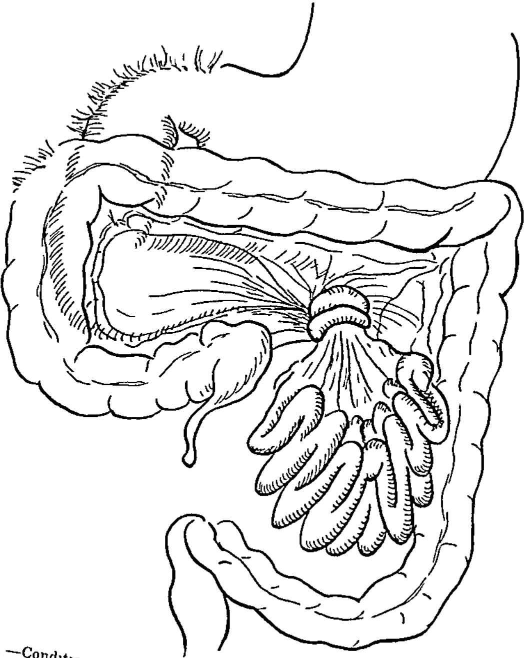

Fig 1 —Conditions observed when the cecum and ascending colon are drawn to the left There are peritoneal folds running from beneath the liver over to the colon

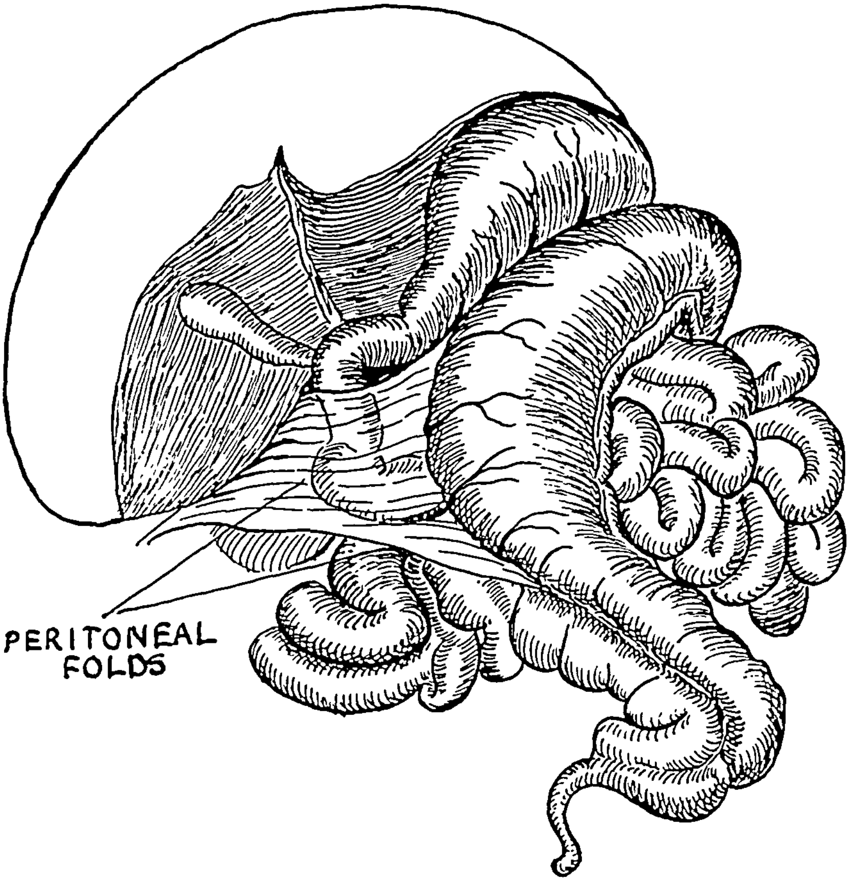

Fig. 2.—Complete 360-degree volvulus of the small intestine in a clockwise direction was present. The rotation of the colon was more nearly complete in this case than is usual in the presence of volvulus.

barium enema in this particular case.

Operative Data.—A long right paramedian incision was made. At first glance only small bowel was seen. This was pressed downward, and the distal end of the cecum was seen in the midabdomen. All of the bowel that could be brought out of the abdomen was now so delivered. This was rather easily done, since the mesentery was long but had a short attachment to the posterior abdominal wall. The small intestine was twisted fully 360 degrees around its mesentary in a clockwise direction. The superior mesenteric vessels were markedly engorged. The volvulus was untwisted in a counterclockwise direction. Before this could be completed, adhesions between some of the coils had to be freed. The most extensive adhesions were located between the proximal parts of the jejunum and the distal portion of the ileum. They were adhered for a distance of about 6 or 8 inches (15 to 20 cm.) as they started to coil around the mesentery. As the volvulus was reduced, it was seen to cause partial obstruction of the duodenum at the ligament of Treitz. The duodenum proximal to this point was greatly dilated. Peritoneal reflections running from the cecum and ascending colon to the right posterior abdominal wall were cut.

The appendix, which appeared normal, was not removed for fear of soiling the peritoneal cavity.

The patient stood the operation well and made an uneventful recovery. He was discharged on October 4 without complaints. He was taking a full diet. At the time of this communication, fourteen months after the operation, he has gained 30 pounds (13.6 Kg.) and has been in good general health. Four months after the operation there developed abdominal pain and distention lasting two hours. This subsided on administration of an antispasmodic and evacuation of the bowels.

Five months after the operation a gastrointestinal series and a barium enema were carried out There was only slight dilatation of the duodenum The large bowel was in the normal position

COMMENT

Ladd and Gross[1] free the cecum by simply incising the peritoneal reflections to the right of the cecum, thus taking the pressure off the duodenum The cecum then remains on the left side of the abdomen In their opinion no attempt should *usually be made to restore the normal* anatomic position of the cecum Their results have been excellent In the case reported here the cecum was comparatively easy to restore to its normal position

The well organized adhesions between the coils making up the volvulus suggests that the volvulus was of long standing The bouts of vomiting and abdominal pain were undoubtedly due to excess twisting of the volvulus, causing temporary complete obstruction

Ordinarily one would expect a barium enema to yield definite information in the presence of malrotation of the cecum In this case, however, the cecum was more completely rotated than is usual, also, it was quite mobile Therefore, a barium enema study in this case might not have been of much value

One naturally speculates as to whether volvulus is apt to recur According to the literature, recurrence is very rare

SUMMARY

A case is reported in which incomplete rotation of the cecum with volvulus of the midgut was operatively treated, with a successful result

RÉSUMÉ

On rapporte le cas d'une rotation incomplete du coecum avec volvulus opere avec succes

ZUSAMMENFASSUNG

Es wird ein Fall von unvollstaendiger Rotierung des Coecum mit Volvulus des Duenndarms berichtet, der erfolgreich chirurgisch behandelt wurde

RESUMEN

Se comunica un caso de rotación cecal incompleta con volvulo intestinal medio, tratado operatoriamente con resultado satisfactorio

RIASSUNTO

Riporta un caso di rotazione incompleta del cieco con volvolo del mezz'intestino trattato con operazione, con successo

SUMÁRIO

Um caso e'apresentado no qual a rotacão do coecum com volvulus do intestino delgado foi bratado operaboriamente com resultado sabisfato'rio

REFERENCE

1 Ladd, W E and Gross R E Abdominal Surgery of Infancy and Childhood, Philadelphia W B Saunders Company, 1947, chap 5

Of Fame

The fame of great men ought always to be estimated by the means used to acquire it

—*La Rochefoucald*

No true and permanent fame can be founded except in labors which promote the happiness of mankind

—*Sumner*

Tantalum Mesh in Hernia Repair

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TANTALUM mesh has now attained a fairly wide use all over the country. This is a comparatively recent development. My attention was first called to the material by the director of research of one of the leading surgical supply houses* early in 1946. He was kind enough to send me some of the material for experimental and clinical trial. He also sent some of it to two other surgeons in this country and to one in England. So far as I know, I made the first report on the material before the meeting of the Southern Medical Association in 1947.[1] The other surgeons to whom the material was first sent have also reported the results of their experiences with it.[2] Since my first paper, I have made several other reports on its experimental and clinical use.[3]

Tantalum is a rare metal which causes no unfavorable reaction whatsoever in the tissues. The metal was first used surgically by Burch and Carney,[4] of Vanderbilt University, and by Burke[5] of Canada. Although Burke had priority of publication, Burch and Carney were actually the first users[6] of the metal and first used it as plates and screws in orthopedic surgical procedures. Tantalum mesh, however, was first used as outlined in the preceding paragraph.

The mesh is an ordinary wire screening made from tantalum wire 3 mils (0.003 inch) in diameter. The mesh which has been used so far is 50 by 50 mesh, i.e., 50 strands to the inch in each direction. The material is very pliable, and patients in whom it is implanted are unaware of its presence.

In the first *experimental work* several inches of the rectus sheath and muscle on each side were resected in dogs and the defect repaired by suturing to the fascial edges of the defect a suitable-sized piece of tantalum mesh. Subsequent examination of these animals showed an exceedingly strong repair of the abdominal wall, the surrounding fibrous tissues having grown through and around the mesh so as to form an unusually strong closure. There was no evidence of any unfavorable reaction, and the fibrous tissue could not be pulled away from the mesh. It could be taken away only by sharp dissection.

The mesh has been used *clinically* as follows:

1. In ventral hernias: (*a*) to close defects in which the fascial edges could not be approximated, and (*b*) to reinforce weak suture lines which in themselves were not strong enough to insure a cure of the hernia.
2. In inguinal hernias with poor tissues and large defects.
3. To repair congenital absence of the abdominal wall.
4. To replace the abdominal wall after resection of large abdominal wall tumors.

The technic of using the mesh has been amply described in previous publications.[7] In *ventral hernias* it is desirable to use a piece much larger than the defect, because the fascia surrounding the defect is apt to be weak, and, unless the whole abdominal wall in this region is reinforced, a hernia may break through the weak fascia at the edge of the implanted piece of mesh. The edges of the mesh are turned over for about ¼ inch (0.6 cm.), making a double thickness all the way around, and the mesh is sutured in place with interrupted sutures of tantalum wire placed through the doubled edge approximately 1 inch (2.5 cm.) apart.

In *inguinal hernias* with poor tissues and large defects, a piece of mesh is su-

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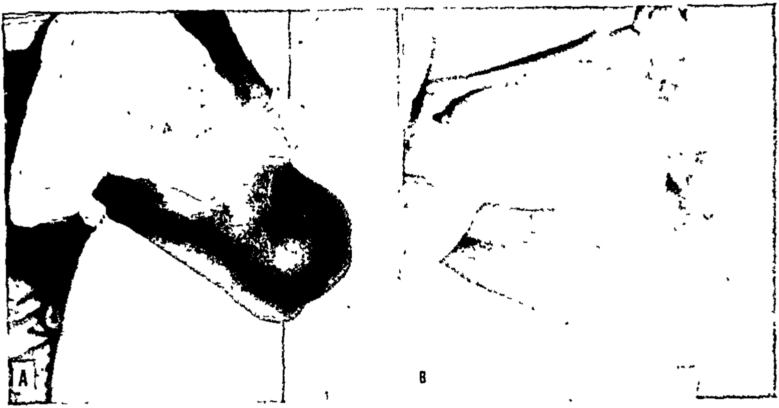

Fig. 1.—*A*, photograph of A. J., a woman aged 46, with a large epigastric hernia which had been present for many years and irreducible for nine years. Operation was performed on March 1, 1948. *B*, postoperative view. Result at time of writing still excellent.

tured in place in order to reinforce the entire Hesselbach's triangle area. The mesh is sutured to Poupart's ligament below. Very few other sutures are required, as the mesh tends to stay in place, being held there by the adjacent layers of muscle and fascia. If the Cooper's ligament repair has been used, the mesh should be sutured in the depth of the depression over the conjoined tendon-Cooper's ligament suture line, so as to keep it in contact with this suture line and thus provide reinforcement of it by the ingrowth of fibrous tissue from the surrounding structures through the mesh. The method of using the material for the repair of inguinal hernias is being published elsewhere.[5]

I have used the material in 147 operations on large ventral hernias and difficult inguinal hernias (mostly recurrent), the cases being about equally divided between the two types. The first repair was done almost five years ago and the most recent one less than a month ago. So far there has been only 1 recurrence, which occurred in a case of bilateral inguinal hernia that had been operated upon twice before. One side, the second side done at the operation, had very poor tissues and a large defect. I know from experience gained since then that the piece of tantalum mesh used was far from being adequate in size. The hernia promptly recurred on this side, but has since been repaired adequately with tantalum mesh, and I believe now that the cure will be permanent. The second operation was done a year ago. The details of this case are being reported elsewhere.[9]

The results have been so good with tantalum mesh that they have encouraged me to treat some conditions which I do not believe could have been cured by any of the ordinary methods hitherto available to surgeons. A good example is the case of a 39-year-old woman who had undergone an operation about a year and a half previously for cancer of the bladder involving the ileum. A total cystectomy had been done, with removal of all the pelvic generative organs and 3 feet of ileum. The ureters had been transplanted into the sigmoid. The operation had been performed through a transverse in
and the abdominal muscles and fasci
retracted upward and downward
defect extended from the umbilicus

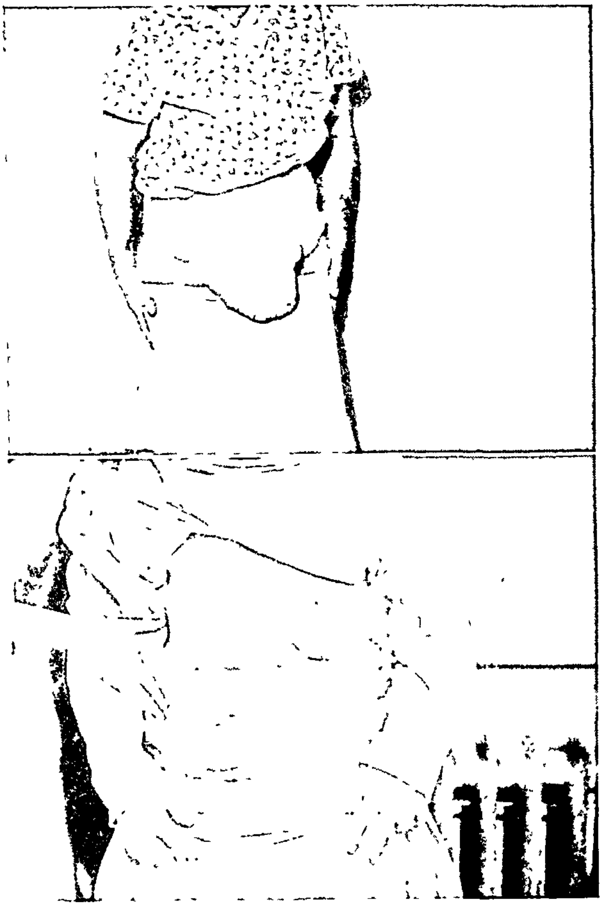

Fig. 7.—*A*, photograph of D. M., a woman aged 73, who had had a neglected umbilical hernia for forty years, which finally began to cause symptoms of obstruction. Operation was performed on Nov. 16, 1948. *B*, postoperative view. Result excellent.

symphysis, and laterally in each direction to the inguinal canal. There was literally nothing below the patient's umbilicus in the nature of an abdominal wall except skin, subcutaneous tissue and peritoneum. The defects was repaired by suturing in an enormous piece of tantalum mesh covering the entire lower part of the abdomen. This operation was done more than two years ago, and the patient still has a strong closure. I have seen several other defects equally large. I do not believe that these patients could have been successfully operated upon by using fascia flaps, free transplants of fascia, either autogenous or preserved,[10] or cutis grafts. The defects were too large, in my opinion, for successful use of these materials.

An interesting case was that of a 4-year-old child with *congenital absence of the upper half of the abdominal wall.* The condition rendered the child an invalid and prevented him from playing with other children of his age. At operation it was found that he had nothing but skin and peritoneum in the defective area. There was no subcutaneous tissue and no preperitoneal tissue. The skin was tightly glued to the peritoneum, and it was very difficult to separate the two. In so doing, each structure was buttonholed in several places. In spite of this, the tantalum mesh was placed between the two thin structures and fortunately "took". This operation was performed almost three years ago, and the result is excellent. Immediately after it the child abandoned his role as an invalid and for the first time began a normal life, playing normally with other children.

One of my early cases was that of a woman with a large defect in the left upper abdominal quadrant resulting from a gunshot wound. After many intestinal adhesions had been released from the sac, there was barely enough peritoneum left to close. This made me wonder what would happen if I encountered a case in which the peritoneum could not be closed and in which I wanted to use tantalum mesh. I therefore created large defects in the abdominal walls of dogs by removing the rectus muscle and fascia and peritoneum. These defects were repaired with tantalum mesh. The greater omentum and the spleen had also been removed so that there would be no buffer between the intestines and the mesh. Examination of these dogs months later showed that there were mild adhesions between loops of the intestine and the mesh, but that they were in no way obstructive and interfered in no way with the health of the animals. Shortly after these experiments were completed I had occasion to remove a huge melanoma from the abdominal wall of a patient and had to sacrifice a good deal of peritoneum The melanoma was 6 inches (15 cm) in diameter and involved the umbilicus The tumor was removed, a margin of 1 inch (2 5 cm) being allowed all the way around The umbilicus and the round ligament of the liver were taken out A block dissection was made from the site of the tumor to the axilla, taking away a lane of skin, subcutaneous tissue, and fascia, and doing an axillary dissection In closing the defect I had no hesitancy in *placing the tantalum next to the bowel* This was necessary because the patient had a short omentum which could not be brought down to protect the intestines from the tantalum This patient was operated upon a year and a half ago and has been perfectly well since then, without any abdominal complaints or any other evidence that he has been inconvenienced by the fact that the tantalum was next to the bowel

One of the questions that arose early in the use of tantalum mesh was as to how it would behave *in the presence of infection* Extensive experiments were conducted in order to determine this Wounds containing tantalum mesh and wire were purposely infected Even where there was gross infection and pus literally poured out of the wounds, they healed without sinus formation, leaving a very strong closure, just as if they had never been infected This did not occur, however, if silk or cotton was used along with the tantalum When these materials were used in the infected wounds, a persistent sinus resulted

As a result of these experiments, I did not hesitate to operate in several cases of potential infection One case was that of a man weighing 267 pounds (121 1 Kg), who had had a gall bladder operation, wound disruption, hernia, and repair of the hernia followed by recurrence At the time of operation, owing to the enormous pendulous ventral hernia, he had excoriations of the skin which had been present for a year and which could not be induced to heal even with two months of bed rest and treatment before operation Operation was therefore undertaken, and the defect was found to be 6 inches (15 cm) wide and to extend from the costal margin to Poupart's ligament This defect was repaired with tantalum mesh, but silk was used to close the peritoneum and subcutaneous tissue I did not wish to use monofilament tantalum wire in the peritoneum because I thought it would cut through (Braided tantalum wire was not then available) The patient developed a severe infection from which pus poured out A sinus tract persisted for a year and then closed after an offending silk suture was removed The patient was operated upon almost three years ago, and the result is excellent He was a semi-invalid prior to operation but is now happy and healthy and enjoying himself thoroughly

Another case was that of a hernia following a gallbladder operation in a huge patient He had had an abscess in the abdominal wall in the hernial area several weeks prior to the operation for repair of the hernia I operated upon him, being well aware of the possibility that his wound might become infected However, by this time braided tantalum wire was available, and instead of using silk to close the peritoneum I used braided tantalum wire His wound did become infected after operation and considerable pus was discharged However, the wound healed promptly without sinus formation and the patient has remained cured

Another case was that of an 82 year-old man who had had a Miles operation with a midline colostomy five years previously He developed an enormous postoperative hernia, with his colostomy opening right in the center of it A few weeks prior to repair of the hernia, the colostomy opening was removed as far lateralward as possible In spite of this, it was obvious that the danger of wound contamination was fairly great The hernia was repaired with tantalum mesh, and the wound healed per primam

A woman measuring exactly 5 feet (152 4 cm) tall in her stocking feet and weighing 252 pounds (114 3 Kg) in her nightgown had an enormous ventral hernia with a huge hanging flap of abdominal fat. The hernia was repaired with tantalum mesh. After the operation, owing to the wide dissection of the skin flaps, the thickness of the panniculus, and the poor circulation, she developed an area of necrosis of the skin and fat 2 inches (5 cm.) in diameter. This was many inches deep and had to be cut away, leaving an area of mesh exposed. *Granulations* could be seen *growing through the mesh*, and the entire area gradually closed. Wright[11] has reported a similar case, as have also Bussabarger, Dumouchel and Ivy.[12]

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One hundred and forty-seven cases of difficult ventral and inguinal hernias are reported in which tantalum mesh was used in the repair. The oldest case is now almost five years old and the most recent one less than a month old. There was 1 recurrence—of a twice recurrent inguinal hernia in which an inadequate piece of mesh was used in the repair.

In 1 case a large congenital defect of the abdominal wall was successfully repaired.

Tantalum mesh may be used next to the bowel without untoward effect when there is not sufficient peritoneum to close the defect in the peritoneum.

Tantalum mesh in infected wounds does not interfere with healing and does not cause a persistent sinus tract unless cotton or silk is used along with it.

Cases are reported in which the mesh became exposed, granulation tissue grew through it, and healing ensued.

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Se comunican 147 casos difíciles de hernia inguinal y ventral, en los que se usó malla de tántalo para reparar. El caso más viejo tiene ahora casi 5 años y el más reciente menos de 1 mes. Hubo 1 recidiva de una hernia inguinal recidivante doble en la que se usó en la reparación una pieza de malla inadecuada.

En 1 caso se reparó con éxito un gran defecto congénito de la pared abdominal.

La malla de tántalo puede usarse inmediata al intestino sin efecto desagradable, cuando no existe suficiente peritoneo para cerrar correctamente.

La malla de tántalo no interfiere la curación en las heridas infectadas, no produciendo trayecto fistuloso persistente con excepción de su uso con algodón o seda.

ZUSAMMENFASSUNG

Es wird ueber 147 Faelle von schwierigen Bauch- und Leistenbruechen berichtet, in denen bei der Operation ein Tantalumnetz zur Anwendung kam. Der aelteste Fall liegt jetzt beinahe fuenf Jahre und der juengste weniger als einen Monat zurueck. Es kam ein Rueckfall vor, und zwar bei einem Kranken mit einer zweimal wiederauftretenden Leistenhernie, bei deren Schliessung ein unzureichendes Stueck Tantalumnetz angewandt worden war.

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Das Tantalumnetz kann, wenn nicht genuegend Bauchfell zum Schlusse des Peritonealdefekts vorhanden ist, ohne nachteilige Wirkungen in unmittelbarer Naehe des Darms verwendet werden.

In infizierten Wunden fuehrt das Tantalumnetz weder zu einer Behinderung der Heilung noch zu permanenten Fistelbildungen, wenn nicht gleichzeitig Baumwolle oder Seide benuetzt werden.

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Prognosis of Septic Thrombophlebitis of the Cavernous Sinus

H. I. LILLIE, M.D., F.A.C.S.
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FORMERLY considered a disease with an extremely high mortality rate, septic thrombophlebitis of the cavernous sinus treated by present-day methods offers a favorable prognosis.

The disease has long been known. No one observer in his professional lifetime has encountered any great number of cases; still, the accumulated literature on the subject is extensive.

The historical aspects of the treatment of this condition are interesting. Ballance[1] has said aptly, "History is as essential to the philosophy of any branch of medicine as is actual clinical experience to its successful practice." He cited many cases in which thrombosis of the cavernous sinus occurred secondarily to infection of the temporal bone and in which details of surgical treatment and necropsy observations were given. In many cases successful surgical intervention was accomplished so far as reaching the cavernous sinus was concerned, but the patients died of meningitis and sepsis.

Grove[2] reviewed the literature up to 1936 and estimated that more than 400 cases had been reported. He cited 50 references to the literature and reported 4 cases he had encountered. The incidence of the disease could not be estimated. The mortality rate was so high that the probabilities were that many cases were not reported. It is not often that failures are reported.

Eagleton[3] dealt with the subject in a lucid manner. Although generally known as a radical surgeon, he advocated only ligation of the carotid artery in the treatment of cavernous sinus thrombosis, in order to put the cavernous sinus at rest. The surgical attack previously employed had been extremely unsatisfactory. He described his experience in 25 cases. He divided his cases empirically into those in which there was a fulminating type of infection and those in which there was a delayed type of involvement. He expressed the opinion that in the latter group the thrombosis occurring in the cavernous sinus was due to retrograde changes and was more or less protective. This group, however, composed only one third of the cases encountered. Elimination of the primary source of infection in this group was effective occasionally in controlling the disease.

At present the prognosis seems much more favorable. Recent reports of treatment of septic thrombophlebitis of the cavernous sinus have been very encouraging. For the fulminating type of infection surgical intervention has been abandoned in favor of treatment with chemotherapeutic agents, antibiotics and anticoagulants. The literature for the past ten years has been reviewed; 21 references were found, in which 27 cases were reported. There were 2 deaths. The treatment consisted of (1) chemotherapy; (2) chemotherapy and use of antibiotics, and (3) chemotherapy and use of antibiotics and anticoagulants. The antecedent causes of the disease in the reported cases were multiple. The ages of the patients varied from 4 months to that of an old man.

Anatomic Background.—The cavernous sinus is important because of its anatomic relation to other important structures. Actually, as a blood channel it is the least important of the intracranial sinuses except that its tributaries are the ophthalmic veins anteriorly and the petrosal sinuses posteriorly. It differs from the other in-

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tracranial sinuses in that its cavity is traversed by numbers of delicate interlacing fibers that divide the interior of the sinus into many intercommunicating cavern-like spaces This mechanical arrangement is of importance if the blood in the sinus becomes coagulated Figures 1 and 2 reveal the anatomic relation of the cavernous sinus better than does a description of it in words The relations are significant because, when the structures are involved by disease, the effect on them is revealed in unmistakable physical signs

The cavernous sinus is connected with its fellow by a number of intercavernous sinuses called the circular sinuses This *fact is often important in differential diagnosis* Also of great importance is the fact that venous plexuses from outside the skull connect with the cavernous sinus by means of small emissary veins, notably the pharyngeal and pterygoid plexuses The connection between the external facial *vein and the ophthalmic veins is highly* significant in clinical cases

Symptoms and Signs —The history may reveal that infection was present in the temporal bone before the signs of cavernous sinus thrombosis became manifest It can then be assumed that retrograde extension through the petrosal sinuses has taken place The symptoms may have been suggestive of petrositis Notably the character of the pain is nearly identical in petrositis and cavernous sinus thrombosis, as it is occurs behind or around the eye The pain usually precedes physical signs

The history may reveal that the original infection has occurred in structures situated anteriorly to the cavernous sinus and has spread through the ophthalmic veins Acute infections of the paranasal sinuses, osteomyelitis of the maxilla and frontal bones, cellulitis and furuncle of the face, tonsillitis, nasopharyngitis and the removal of infected teeth are sources of infection that have often been reported Smith[4] undertook to make a composite tabulation of the earlier reported etiologic factors and found that 40 per cent of infections of the cavernous sinus were due to infections of the ear, 35 per cent to infections of the orbital and facial structures, 13 per cent to infections of the mouth and teeth, 9 per cent to infections of the nasal structures, and 3 per cent to remote causes

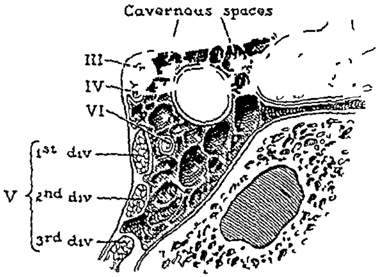


Fig 1 —Cross section of the cavernous sinus and its contents The Roman numerals indicate the corresponding cerebral nerves

When the cavernous sinus becomes involved from infections anterior to its position, pain may not be the initial symptom

The manifest signs of thrombosis of the cavernous sinus are those due to venous congestion of the ophthalmic veins and are (1) edema of the orbital structures and eyelids, (2) chemosis of the conjuctiva and (3) proptosis of the eyeball Later, ophthalmoplegia occurs These signs may be present in cases of aseptic thrombosis Edema of the face and engorgement of the veins over the frontal sinus indicate that the external facial vein is thrombosed

Retinal changes are generally considered relatively unimportant, if present, they indicate meningeal involvement If swelling and edema occur in the orbital structures of the opposite side they may be considered very important signs

The general discomfort is great What has been said is equally true of aseptic and septic thrombosis of the cavernous sinus and quite true of several other conditions to be considered in differential diagnosis

If, in addition to what has been said, general evidence of sepsis is present, such as high fever with remissions and positive culture of the blood, the diagnosis of cavernous sinus thrombosis is strongly suggested. The identification of the infecting organism is more important now than formerly, because the choice of chemotherapeutic drugs and antibiotics depends upon it.

Differential Diagnosis.—The pathologic conditions that may involve the structures of the orbit and cause similar gross physical signs of thrombosis of the cavernous sinus are (1) orbital cellulitis, (2) swelling of the eyelids incident to acute infections of the paranasal sinuses, (3) abscess within the orbital cone, (4) subperiosteal abscess within the orbit extending from the paranasal sinuses and (5) tenonitis. The degree of apparent illness in the aforementioned conditions may not be so definite as in septic thrombosis of the cavernous sinus. Only orbital cellulitis and intraorbital abscess, and possibly tenonitis, should offer much difficulty in differential diagnosis. Examination of the ocular fundus is always especially important; in the presence of orbital lesions changes in the fundus are common, but they are not commonly associated with thrombophlebitis of the cavernous sinus unless the meninges are involved. Culture of the blood may not give positive results in any of the conditions, but positive results are more to be expected when the cavernous sinus is involved. If culture of the blood gives positive results, it is nearly confirmative as evidence of septic cavernous sinus thrombosis.

The duration of the illnesses just mentioned may be similar. The onset may have been fulminating; this may then be considered of grave significance, and it may imply that increased difficulty is likely to be encountered in making a differential diagnosis. If the onset has been gradual and the signs atypical, it is suggestive of involvement of the cavernous sinus.

The identification of the original site of infection is very helpful in arriving at a diagnosis. If the original signs follow some remote cause, such as removal of an infected tooth or the presence of a facial furuncle or cellulitis, it is more probable that the signs are caused by thrombosis of the cavernous sinus. If the signs have persisted for an unusually long period, an exploratory operation may reveal an abscess behind the eyeball. This has occurred in my experience.

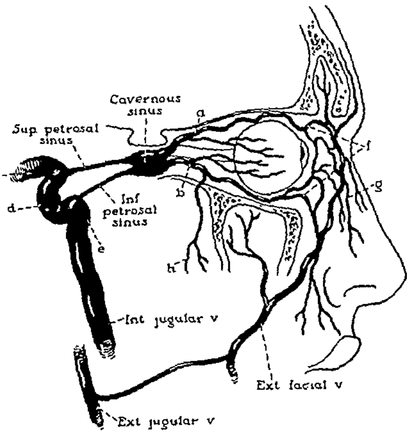
Other conditions, such as mucocele or pyocele of the frontal and ethmoid sinuses, pseudoorbital tumor, orbital tumors, aneurysm or malignant exophthalmos may present the general physical signs of cavernous sinus thrombophlebitis but should offer little difficulty in differential diagnosis.

Mayo Clinic Cases.—It has been said that no one observer may have encountered many cases of cavernous sinus thrombosis in his professional lifetime. During the past thirty-two years 10 cases of cavernous sinus thrombosis have been encountered at the Mayo Clinic. If necropsy findings are necessary to prove that the diagnosis was correct, then the number would be decreased. With the present form of treatment under which so many recoveries take place, it occurs to me that certain men may question the diagnosis. However, it does not seem that such an attitude is warranted.

Data on the cases of cavernous sinus thrombosis encountered at the clinic are given in the accompanying table. That treatment was ineffective in the early patients is obvious. Necropsy in the cases in which it was carried out revealed that the diagnosis had been correct. It is assumed that the other diagnoses were correct.

In Case 10 it was unfortunate that penicillin was not available for use at the time. The patient did not tolerate adequate doses of the chemotherapeutic agents even under the best auspices. The infecting organism, Streptococcus viridans, was known to be resistant. Had aureomycin, then unknown, been available, the result might have been different.

It will be noted that in only 1 patient (Case 7) was infection of the temporal bone and petrous pyramid the antecedent cause. The fulminating character of the



a and *b*, ophthalmic veins

c, lateral sinus

d, sigmoid sinus

e, jugular bulb

f and *g*, angular veins

h, vein from pharyngeal plexus

Fig. 2.—Venous tributaries to the cavernous sinus.

infection made the prognosis unfavorable from the onset. Recognition of petrositis in other patients before the onset of symptoms and before signs of cavernous sinus thrombosis developed may have been responsible for decrease in incidence of the disease from the standpoint of ear infections.

An early experience with antral puncture in a case of acute maxillary sinusitis (Case 2) caused my colleagues and me to change our attitude toward the treatment of acute sinusitis. Up to that ime it was common practice to relieve the discomfort of acute maxillary sinusitis by antral lavage. It will be noted in Cases 4 and 5 that the antrum had been punctured for relief of symptoms before the patients presented themselves at the clinic. Two patients not reported on were considered originally to have cavernous sinus thrombosis, but the course was atypical, and, on exploration, abscesses in the orbit posterior to the globe were found and recovery was prompt. The experience of this small group does not warrant drawing conclusions.

Present-Day Treatment.—The consensus at present is that surgical intervention should be abandoned in the treatment of acute fulminating thrombophlebitis of the cavernous sinus. Subsequent drainage of localized infection naturally should be carried out.

Appropriate chemotherapeutic agents and antibiotics and possibly anticoagulants should be administered at the earliest possible moment even though the diagnosis is not established. If culture of the blood reveals that the choice of therapeutic agents could be improved upon, it should be done. The otolaryngologist, who throughout the years has been considered by the profession the proper physician to undertake the treatment of cavernous sinus thrombosis, should work in cooperation with the chemotherapist in the interest of the patient. The chemotherapeutic drugs have been used so indiscriminately for many minor, self-limiting infections that hypersensitiveness to them may have occurred unknown to the physician encountering a patient with a severe infection in which the use of the drug is urgently demanded. Actually, chemotherapy and treatm [illegible] ibiotics, and espe-

Data on Mayo Clinic Cases of Cavernous Sinus Thrombosis

Case	Year	Age (years), Sex	Antecedent Cause	Duration of Symptoms	Treatment	Result	Pathologic Observations
1	1921	35 M	Suppurative sinusitis	3 days before admission	Supportive	Died 3 days after admission	Thrombosis of cavernous sinus retrograde to petrosas, jugular bulb and sigmoid sinus
2	1922	27 M	Acute sinusitis	1 day after antral puncture	Supportive	Died 6 days postoperatively	Thrombosis of orbital veins; thrombosis of cavernous sinus; meningitis
3	1924	23 M	Nasal furuncle	12 days before admission	Supportive	Died 60 days after admission	No necropsy
4	1927	45 F	Dental extraction; antral puncture; pelvic abscess	8 weeks before admission	Supportive, spinal drainage	Died 12 days after admission	Meningitis; suppurative sphenoiditis; cavernous sinus thrombosis; abscess of temporal lobe
5	1931	7 M	Acute sinusitis; antral puncture	7 days before admission	Supportive	Died 7 days after admission	No necropsy
6	1934	17 F	Acute tonsillitis; acute rhinitis; acute suppurative otitis media	3 weeks before admission	Supportive	Died 6 days after admission	No necropsy
7	1935	12 M	Acute suppurative otitis media with petrositis and meningitis	5 days before admission	Supportive; exploratory mastoid operation	Died 3 days postoperatively	Osteomyelitis of petrous pyramid; cavernous sinus thrombosis; suppurative meningitis; hemolytic *streptococcus*
8	1939	33 M	Nasal furuncle	2 days	Intravenous penicillin; sulfadiazine	Recovery	
9	1941	9 F	Nasal furuncle	18 days before admission	Sulfadiazine; transfusion	Recovery	
10	1942	43 M	Chronic maxillary sinusitis; intranasal operation	6 weeks before admission	Exploratory removal of sequestra; penicillin not available	Died 10 days postoperatively	Cavernous sinus thrombosis; longitudinal sinus thrombosis; meningitis; streptococcus viridans

cially treatment with anticoagulants, have become a medical specialty, and the physician undertaking these forms of therapy should be warned of the necessity of consulting or cooperating with one thoroughly familiar with them It is possible for any physician to become familiar with the necessary details of such treatment, particularly if he has access to a good laboratory where necessary blood determinations can be made, together with other tests necessary to safeguard the patient from the danger of complications that may result from overdosage or toxic effect of the medicaments There seem to be few contraindications to the use of penicillin unless the patient is sensitive to it Aureomycin and streptomycin have been reported to have certain undesirable effects on occasion

In general, it can be said that adequate doses of any or all of these agents should be used over a sufficient period to insure complete control of the infection Increase in knowledge will come from experience New drugs and antibiotics may be forthcoming which will be more serviceable and effective

At present the prognosis of the once nearly fatal disease, infective thrombophlebitis of the cavernous sinus, has changed from one of futility and despair to one of comparative hopefulness and confidence

SUMMARY

The author discusses septic thrombophlebitis of the cavernous sinus and its prognosis Illustrative cases observed at the Mayo Clinic are cited Modern treatment is outlined, and pertinent data are presented in tabular form

RESUMÉ

L'auteur discute la thrombophlebite septique du sinus caverneux, et son pronostic Il rapporte plusieurs cas de la clinique Mayo comme illustrations Il souligne le traitement actuel, donne des details precis sous forme de tableaux

ZUSAMMENFASSUNG

Der Verfasser eroertert die septische Thrombophlebitis des Sinus cavernosus und die Prognose der Erkrankung An der Mayo Klinik beobachtete Faelle werden zur Erlaeuterung herangezogen Die moderne Behandlung der Ehkrankung wird umrissen, und die wichtigen Daten werden in Tabellenform angefuehrt

RIASSUNTO

L'A discute tromboflebite settico del seno cavernoso e la prognosi Casi esplicativi osservati al clinico Mayo sono citati Trattamento moderno e' delineato, e tema pertinente presentate in forma di tavola

RESUMEN

Se discute la tromboflebitis septica del seno cavernoso y su pronostico Se citan casos ilustrativos de la Clinica Mayo Se señala el tratamiento moderno y se presentan datos pertinentes en forma tabular

SUMÁRIO

O autor discute a tromboflebite septica do seio cavernoso e seu prognostico Casos ilustrabivos observados na Mayo Clinic são por ele citados Esboca bratamento moderno e apresenta dados concernentes em forma de quadros

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Tuberculosis of the Urinary Tract

Present Nonsurgical Treatment

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TUBERCULOSIS of the urinary tract is a chronic and devastating disease. Unlike carcinoma, of which it can be stated that after five or ten years with no recurrent evidence of the disease the patient is presumptively cured, tuberculosis is never cured. It has been shown that early manifestations of this disease, apparently cured, may in later years create active evidence away from the original focus. Therefore, the time element must be ignored unless recurrence develops. One cannot depend upon the relative immunity of the host to eradicate the disease.

The history of tuberculosis of the urinary tract discloses many pertinent facts to substantiate these statements. The disease is never primary; the organism cannot be introduced directly from without (Boyd[1]) but must be carried to the region. The source of the infection is hematogenous (Boyd,[1] Medlar,[2] Weslar[3] and others) and the condition usually bilateral as far as the kidneys are concerned. Occasionally one kidney may eliminate the actual disease, but the invading condition persists.

Until the advent of chemotherapeutic agents the control of this disease in the urinary tract was problematic. The sulfa drugs were a negligible factor. Penicillin, experimentally and clinically, was found to be of no value (Biggar[4]). The advent, however, of the sulfones, streptomycin and para-aminosalicylic acid opened an entirely new avenue of attack (Hinshaw, Feldman and Pfeutze;[5] Lehmann[6]).

The treatment of urinary tuberculosis has undergone various stages: first, rest cure and heliotherapy; second, surgical intervention, and third, at the present time, chemotherapeusis. In the great majority of cases of tuberculosis in the upper part of the urinary tract the condition is bilateral, and the results obtained in the past were not satisfactory. Wilbolz[7] reported that after 660 nephrectomies, at the end of ten years, 40 per cent of the patients had died of disseminating tuberculosis. He arrived at the following conclusion: "We must search for methods by which we may be able to enhance the natural tendency towards healing. This may eventually be found by physical or chemical means." This is now being accomplished by the use of antibiotics, the sulfones and para-aminosalicylic acid, either singly or in combination, and that the urinary tract is especially susceptible to this type of treatment is shown by the work of Baggenstross[8] "disclosing the levels of excretion."

An injection of 0.833 Gm. of streptomycin was administered to animals every two hours for nine injections, equivalent to a maximum of 10 Gm. per day, and the resulting levels were as follows:

	Micrograms per gram
Urine	3,507
Blood serum	120
Kidneys	172.8
Lung	42
Spleen	20.6
Liver	16.9
Cerebral spinal fluid	15.8
Brain	0

These extremely important data are conclusive evidence that the results obtained by the use of antibiotics in urinary diseases are superior to those obtained in any part of the body involved.

Nesbit and Bohne, reporting in the *Journal of the American Medical Association*, concluded: "Streptomycin therapy

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per se is not the entire answer to tuberculosis, nor is surgery in the final analysis a permanent cure because of the unusual number of recurrences either in the other kidney, the urinary tract, or by general dissemination and that by synergism or combinations with streptomycin, the future answer may lie"

In September 1947 I reported the use of the esters of chaulmoogra and hydnocarpus oils in preparation of the bacillus for the chemotherapeutic attack This is based on the hypothesis that there exists a waxy or lipoid capsule around the bacillus which causes it to be resistant to therapeutic measures, and that only by encapsulation through fibrosis or calcification can the organism be made ineffectual This hypothesis is elaborated and employs the principle proved by Woods and Kilts, that a comparative inhibition is produced by the action of chaulmoogric acid The inhibitory agent chaulmoogric acid closely resembles the essential metabolite tuberculostearic acid, which is synthesized by both lepra and tubercle bacilli The chaulmoogric acids are absorbed by the tubercle bacillus, which reduces the surface tension This action results in competition between the drug and the essential metabolites A depression of the enzyme system is necessary for the production of the latter A destructive respiratory action is indicated by the results of the *in vitro* tests

More recently, an editorial by Jobling and Petersen[9] stated that iodine has been observed to neutralize the ferment inhibiting properties of the fatty acids in the caseous material Applying that principle, they concluded that the same autolytic process might serve to promote solution and absorption in other parts of the body and therefore expose the tuberculous patient more readily to the influence of chemotherapeutic agents That, in principle, is the plan here advocated

Because it is a known fact that the disease in the urinary tract may manifest itself for many years (in some of my own cases as long as thirty years) after the advent of the primary infection, treatment was then instituted to combine the use of the oils and the chemotherapeutic agents at hand to destroy the bacillus This has been accomplished by the following experiments

In vitro studies were carried out by growing the human bacillus, H37, on the Tween 80 media of Dubos [10] These studies have been furthermore carried out *in vitro* and *in vivo* to substantiate and correlate the final clinical data, with the following results Mycobacterium tuberculosis was grown on a liquid medium containing Tween 80 and enriched with serum albumin In controls, growth appears in about three days and increases up to eight days (*a*) Saline suspensions were sensitive to 3 125 units of streptomycin (*b*) Moogrol suspensions were sensitive to 1 56 units of streptomycin, and growth became evident later than in (*a*) The strength of moogrol used appears to delay the growth of M tuberculosis but not to kill it

Calloman and Kolmer,[11] investigating the synergistic action of streptomycin and one of the sulfones, diasone, reported striking results from *in vitro* studies, but their clinical results did not substantiate these observations However, Petter and Pfuetze,[12] in a large group of cases of pulmonary tuberculosis treated with the same sulfone and streptomycin, reported rather satisfactory results Smith and McCluskey[13] were enthusiastic in their use of the sulfone, promin and streptomycin, but noted that this sulfone proved extremely toxic Their investigations are being continued in search of an additional combination, which they know must exist Recently, Lincoln, Kermise and DeVito[14] reported the results of utilizing streptomycin and promizol for tuberculous meningitis These results were striking in 5 of 7 cases

It remained for S A Waxman,[1] who gave us streptomycin, to establish the following conclusion 'The most significant of the factors and problems of the clinician is the development by the tubercle organism of resistance to streptomycin In order to overcome these limitations an extensive search must be made for other agents that would be more effective alone or combined with streptomycin. Apparently, a combination of streptomycin in experimental tuberculosis results in a greater therapeutic effect than the individual component."

The studies of Lehmann to determine the effect of para-aminosalicylic acid on the tubercle bacillus both in animals and in man confirmed his original concept, not only when the substance was used as the sole chemotherapeutic agent but especially when it was administered in combination with other tuberculostatic agents, such as streptomycin. Its major usefulness in combined therapy is to delay the emergence of organisms resistant to the antibiotics. This makes it possible to prolong appreciably the effective administration of streptomycin.

It is interesting to note in the work of all these former investigators that, although the action of streptomycin in the tuberculous patient seemed satisfactory to a degree, the final end results were not entirely so. The tubercle bacillus was still too resistant and the combinations employed too ineffectual against this organism. With the hypothesis, therefore, of the marked morphologic resemblance of the mycobacterium of leprosy to the mycobacterium of tuberculosis, it was demonstrated that there exists a protecting waxy fatty lipoid or membrane cell wall around the bacillus. This has been demonstrated by Mudd,[16] and by our own investigators in conjunction with Dr. Francis W. Bishop of Rochester, New York (Figs. 1, 2 and 3). These changes have been disclosed by the electron microscope, which established the existence of the cell wall. The esters of chaulmoogra oil or hydnocarpus have been used successfully in the treatment of Hanson's disease (leprosy), and the protecting wall has been shown to under-

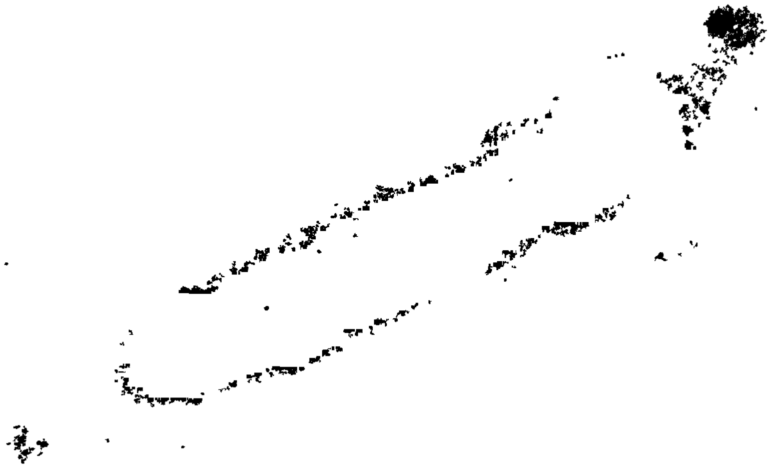

Fig. 1.—Electron microscope photograph of human M. tuberculosis, magnified 33,500 times, disclosing fatty or waxy capsule surrounding the bacillus with lipoid substance and granular polar bodies.

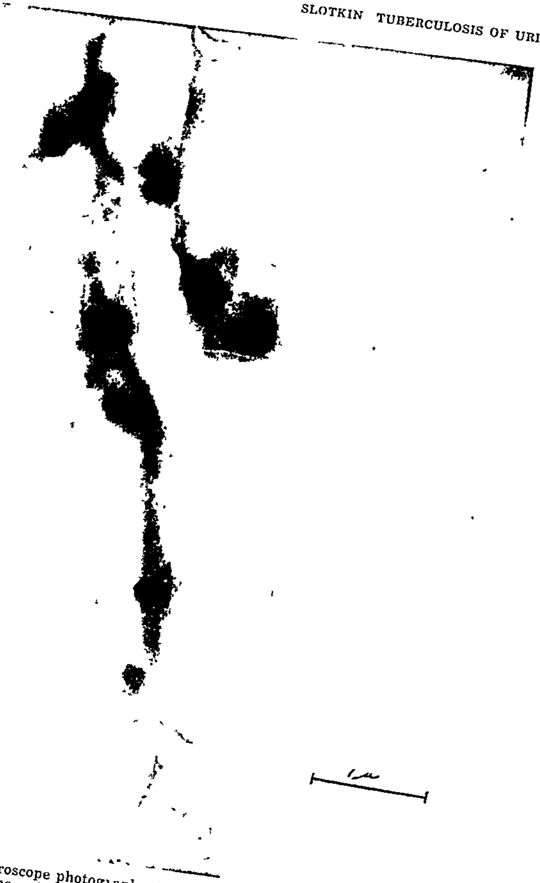

Fig 2.—Electron microscope photograph of M. tuberculosis after exposure for thirty-six hours to the esters of chaulmoogra or hydnocarpus oil (dilution 1:1,000), disclosing disintegration and beginning dissolution of the capsule and changes in the lipoid substance of the bacillus.

go dissolution and disintegration associated with definite morphologic changes in the bacillus, softening and preparing the same for further lethal action. Thus, by adding streptomycin, my associates and I have been able to attack the organisms more readily and effectively than as formerly possible.

In a paper presented by Profes r Do C. Van Cappellan of Amsterdam Holland at the Washington meeting of the American Urological Association in June

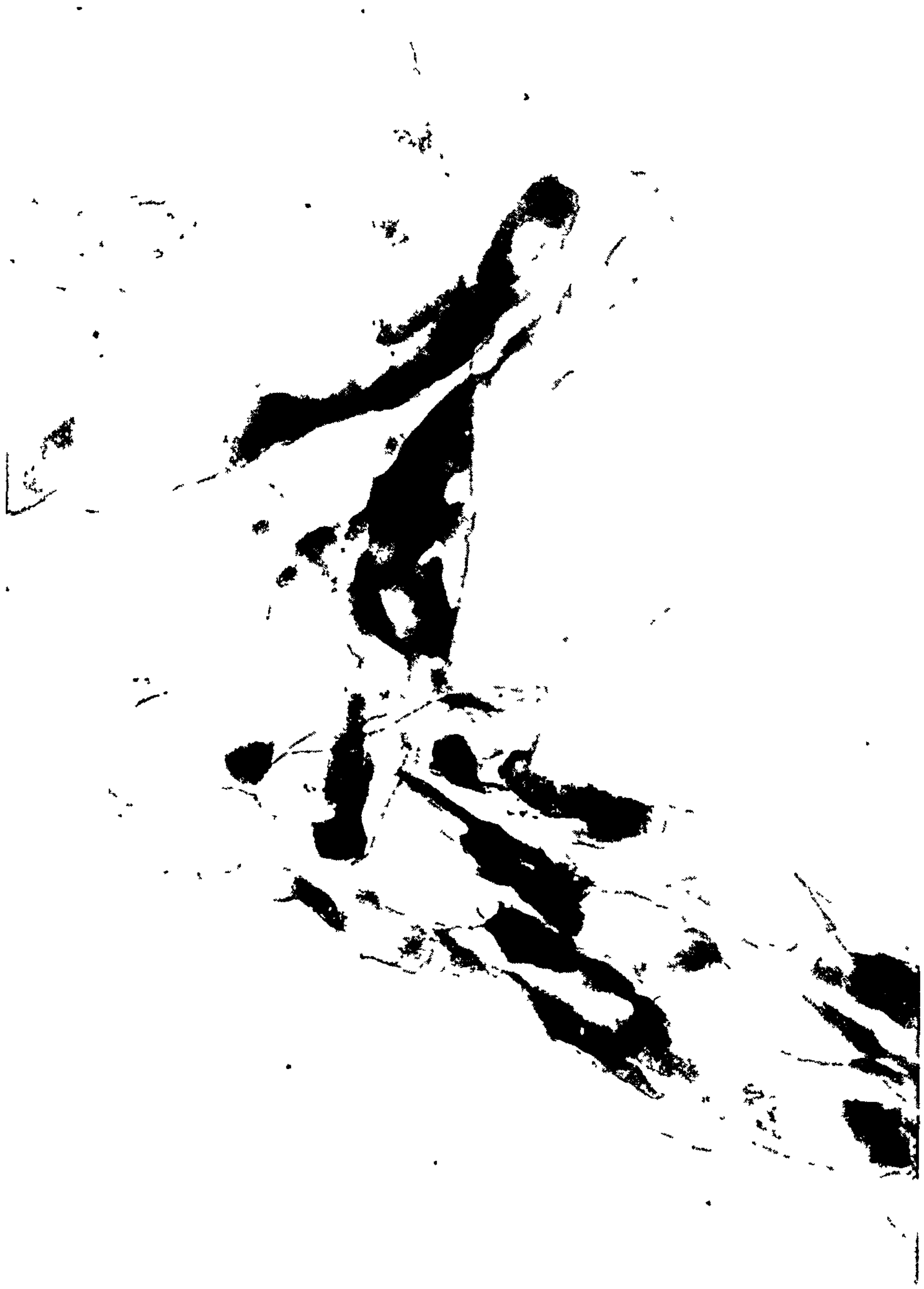

Fig. 3.—Electron microscope photograph of M. tuberculosis after exposure for seventy-two to ninety-six hours to esters of chaulmoogra or hydnocarpus oil, disclosing marked disintegration and dissolution of the fatty capsule and changes in the lipoid substance of the bacillus.

(to be published), this premise is verified by the essayist. In his experimental laboratory several workers have attempted to remove this fatty or waxy capsule by other physical means.

In a large series of animals that were given the combined treatment in contradistinction to streptomycin, the proportion of negative results was five times greater than with streptomycin alone. In a large series of 17 groups, 2 of each 17 gave negative results after ten weeks with streptomycin alone (16,000 units per day) , 10 of 17 gave negative results after the combined use of streptomycin and moogrol oil It has also been shown both experimentally and clinically that by combining the chaulmoograte, streptomycin and diasone, or para-aminosalicylic acid, that inhibition of the bacterium was 400 per cent greater than with streptomycin alone and resulted eventually in complete lethal action

The tubercle bacillus is a highly resistant organism Brisco and Maddock[17] have demonstrated that it can live under various conditions for months and years

Clinically, Latimer and Dean[18] recently reported the use of streptomycin alone in 25 cases of genitourinary tuberculosis They employed 1 8 Gm of antibiotic daily for twelve months According to their report, 75 per cent of the patients had become "negative" for tubercle bacilli in the urine The longest follow up was thirteen months

Huffines and Webber[19] also reported that, with the use of streptomycin, some previously inoperable conditions had been made safely operable These reports, however, substantiate the fact that prolonged treatment is necessary, with rather large doses of the antibiotic

Van Cappellan, in his recent presentation in Washington, D C , summarized his treatment for urinary tuberculosis preoperatively, postoperatively, and in the bilateral or complicated case where surgical therapy is not indicated, by citing statistics from a large series employing the synergistic approach

First series moogrol and streptomycin

Second series para aminosalicylic acid and streptomycin

Third series para aminosalicylic acid, streptomycin and moogrol

The evidence gleaned from this third series discloses that the most efficient, permanent and satisfactory response was obtained by the third combination

In our series of 70 cases to date, with 52 male and 18 female patients, 21 had received treatment by streptomycin (50 to 600 Gm) without result By combining the oil with a small dose of streptomycin, I was able to obtain normal urine and marked clinical improvement in thirty to forty five days Two of the patients were extremely ill with bilateral renal tuberculosis, and within thirty days of this treatment were sufficiently recovered so that one kidney showed normal urine and the caseous, degenerative kidney on the opposite side could be safely removed Primary healing took place in ten and eleven days, respectively

The results of the synergistic treatment employed demonstrate that streptomycin in the treatment of urinary tuberculosis is a valuable adjunct and should not be overlooked I believe that I have proved my case for the use of combined treatment in preference to the single component unit because of the rapidity of response to the combined treatment, especially in those cases in which previous streptomycin treatment had failed

I wish to emphasize and reiterate, as I have done in the past, that this treatment is not offered to supplant surgical intervention The caseous, degenerative, functionless kidney or testicle is still a surgical entity, but surgical measures do not eradicate the disease from the host This must be accomplished by eliminating the hematogenous source of the disease with a hematogenous drug It can be accomplished only by employing, until a better or more satisfactory preparation can be offered, the combined use of the preparation that I have mentioned

It has been stated (personal communication) that the urine specimens in many cases, although they become "negative" bacteriologically, still remain pyuric There exist minute or microscopic areas which are undergoing transition from ulceration to scarification, and until complete epithelization takes place the urine will remain turbid It must also be noted that when treatment is administered through the blood stream to diseased tissue which has lost its blood supply, the treatment must either fail or be used over an extended period For this reason sur-

Statistical Review of 70 Personal Cases[*]
Jan. 1, 1947 — July 1, 1950

Age and Sex Incidence

20 to 25	10 M,	3 F
25 to 30	14 M,	3 F
30 to 35	21 M,	7 F
35 to 40	6 M,	2 F
40 to 45	0 M,	2 F
45 to 55	1 M,	1 F
Total	52 M,	18 F

Duration of Symptoms Before Specific Treatment

1 month	2 patients aged 20
3 months	7 patients aged 20
6 months	10 patients aged 20
1 year	14 patients aged 20
2 years	16 patients aged 30
5 years	11 patients aged 30 to 35
10 years	8 patients aged 35 to 45
25 years	2 patients aged 45 to 55

Type of Previous Treatment

Sanatorium and rest cure, 1 to 5 years	21 cases
Sanatorium, rest cure and streptomycin, 1 to 2 years	19 cases
Streptomycin alone, 3 months to one year	6 cases
No treatment	14 cases

Specific Treatment Administered[**]

Moogrol and streptomycin	28 cases (27 neg., 1 pos.)
Moogrol, streptomycin and diasone	9 cases (8 neg., 1 pos.)
Moogrol, streptomycin and para-aminosalicylic acid	33 cases (all neg.)

Results

Moogrol and streptomycin, 28 cases; 2 eventual nephrectomies; complete recovery
Moogrol, streptomycin and diasone, 9 cases; 1 eventual nephrectomy; complete recovery
Moogrol, streptomycin and para-aminosalicylic acid, 33 cases; 1 nephroureterectomy; complete recovery

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[*] In addition to the 70 personal cases, 33 communicated reports were studied.

[**] All of these patients received one to two courses of treatment.

gical intervention is still an important factor when an unusual amount of destruction has taken place.

SUMMARY

Tuberculosis of the urinary tract is a chronic, devastating disease of hematogenous origin. Simple eradication of the diseased focus by previous measures in the past has failed, and chemotherapeutics at present offer a greater relative possibility of cure than has heretofore existed. This can be accomplished more readily by attacking the bacillus with the esters of chaulmoogra oil or moogrol and preparing them for the final lethal action of streptomycin, or sulfone and/or para-aminosalicylic acid or a combination of these, than by use of the individual component. *In vitro* and *in vivo* studies substantiate the results obtained clinically; that the rapid and (to date) permanent negative reaction of the urine can be better obtained by synergistic therapy than by use of the individual antibiotic; and that the clinical response to the same is highly satisfactory—more highly satisfactory than results obtained by prolonged sanitary or hygienic measures with their accompanying economic disadvantages.

These results have been substantiated by others, as witness the publications of two separate investigators, Sullivan,[20] in a recent issue of the *Bulletin of the New England Medical Center* from the Garney Hospital at Tufts Medical College: "This plan of medication provides remarkable palliation for patients with non-surgical tuberculosis of the urinary tract and for those individuals who suffer from intractable tuberculosis cystitis. It is not a substitute for surgery. An operation was performed in four of our cases after the course of treatment had been completed. They further state that they are impressed by the idea of the program which is of great value in preparing management of these cases."

McLean, Smith, Bauer and Smith,[21] reporting from the Royal Victoria Hospital in Montreal on 10 cases, have agreed in principle in the treatment administered and said that in "tuberculosis of the prostate and vesiculitis, it offers striking possibility. In contracted bladders from tuberculosis with negative urines, however, no improvement was noted in the symptoms." This latter contention, I believe, can be answered by the extreme fibrosis that takes place in the bladder during the healing process and also the shrinkage in capacity. In the treatment of the bilateral condition, in preparation for operation and in subsequent healing, they found the treatment of great value.

The present method of treatment has undergone considerable change since the radical conception of this therapy. Unless the patient is extremely ill and cannot be maintained as an ambulatory patient, he is treated as such. Two cc. of esters of hydnocarpus oil (or moogrol) is injected intramuscularly once daily for seven days. This is to prepare the bacillus for the follow-up treatment of 0.5 Gm. streptomycin daily, either in a single dose or divided and administered twice a day. The dose of moogrol is then increased on the eighth day to 3 cc., and the streptomycin is instituted on the eighth day. The sulfone, diasone, 1 Gm. daily, appears to synergize the action of the streptomycin and the oil additionally, and is administered orally, but this preparation is not without its hazards, as marked secondary anemia may occur and must be supervised by periodic blood examinations. Para-aminosalicylic acid is a valuable adjunct to the therapy, but it also has its disadvantages in that it creates gastric and enteric distress. If tolerated, it is preferable to the use of diasone; either, however, is a good choice. If it is elected to employ para-aminosalicylic acid with the aforedescribed treatment, it is administered orally in doses of 20 to 50 Gm. per day (I employ the effervescent tablet of Sharpe & Dohme).

Finally, the attack consists of (*a*) preparing or softening the bacillus for the bacteriocidal effect of streptomycin, not bacteriostatic, employing the oil, (*b*) enhancing receptiveness to the antibiotic by employing either diasone or para-aminosalicylic acid, and (*c*) using streptomycin for the coup de grace.

Reports of over 103 cases, both personal and reported by communication, disclose that this three-pronged attack is at present the best method of approach. Surgical intervention is indicated only if the organism involved is beyond its functional viability, and repair should be supplemented with the aforementioned approach.

ZUSAMMENFASSUNG

Die Tuberkulose der Harnorgane stellt eine chronische vernichtende Erkrankung haematogenen Ursprungs dar. Die in der Vergangenheit angewandten Massnahmen zur Beseitigung des Krankheitsherdes haben versagt, und zur Zeit bieten die chemischen Heilmittel eine verhaeltnismaessig bessere Moeglichkeit zur Heilung alls alles, was bisher zur Verfuegung stand. Die Behandlung fuehrt leichter zum Ziele, wenn der Krankheitserreger erst mit den Estern des Chaulmugra- Oels oder mit Mugrol angegriffen und fuer den Todesstoss mit Streptomycin, Sulfon, Paraaminosalizylsaeure oder einer Kombination von diesen vorbereitet wird, als wenn nur eine dieser Komponenten zur Anwendung kommt. Versuche im Reagenzglas und am Lebenden bestaetigen die klinische Beobachtung, dass eine rasche und bisher staendige negative Harnreaktion durch die synergistische Behandlung besser erzielt werden kann, als durch das einzelne Antibiotikum, und dass der klinische Erfolg einer solchen Therapie bei weitem befriedigender ist, als was durch lang ausgedehnte sanitaere und hygienische Massnahmen mit ihren begleitenden oakonomischen Belastungen erreicht werden kann. Chirurgische Eingriffe sind nur dann angezeigt, wenn der befallene

Organismus seine Funktionstuechtigkeit und Lebensfaehigkeit endgueltig verloren hat, und sollten dann durch das oben erwaehnte Verfahren unterstuetzt werden.

RÉSUMÉ

La tuberculose du système urinaire est une affection chronique, mutilante et hématogène. La simple extirpation du foyer infecté n'a jamais réussi dans le passé; de nos jours, le traitement par les agents chimiques offre un vantage supérieur et plus encourageant. Ce but peut-être obtenu par une attaque ferme du bacille lui-même, grâce à l'huile de Chaumoolgra ou Moogrol, suivie ensuite par une thérapeutique effective à la Streptomycine, ou le Sulfone avec l'acide para-amino-salicylique seul ou combiné. Des études in vitro et sur le vivant confirment les données chimiques; à savoir qu'une action rapide pour la négativation des urines s'obtient plus facilement par une association médicamenteuse, que par l'usage de chaque produit séparément- que les symptômes cliniques s'amendent aussi plus rapidement- plus rapidement encore que la cure d'air, d'hygiène et de repos, traitement qui entraine une certaine déficience économique. Le traitement chirurgical est réservé aux cas où l'organe attaqué, l'est au delà de toute espérance de viabilité physiologique. Ce traitement doit toujours être complété par le traitement plus haut décrit.

RIASSUNTO

Tuberculosi del tratto orinario e' una malattia cronica e devastando d'origine ematogenica. Estirpazione semplice del focolaio per misure precedenti nel passato hanno fallito, e al presente chemioterapeutica offrano piu' grande possibilita' relativa di cura che esisteva altre volte. Questo si puo' effettuare prontamente attaccando il bacillo con esteri d'olio chaulmoogra o moogrol e preparandolo per l'azione finale e mortale dello streptomycin, o sulfone e o para-aamino- salicylic acid o una combinazione di questi, che per mezzo del componente individuale. In *vitro e* in *vivo* studii provano i risultati ottenuto clinicamente, che la rapida ed oggidi permanente reazione negativa dell'orina si puo' ottenere meglio presso di terapia sinergistica che per l'antibiotico individuale; e che la risposta clinica a la stessa e' d'un rango piu' elevato di soddisfazione piu forte soddisfacente che traverso prolungate misure sanitarie o igieniche con incapacita' economica accompagnandolo. Intervento chirurgico e' indicato soltanto se l'organismo cagionato sia al di la' della vitalita' funzionale e mantenimento e dovrebbe essere aggiunto il suddetto avvicinamento.

RESUMEN

La tuberculosis del aparato urinario es una enfermedad hematógena crónica destructora. Ha fracasado la conducata anterior de la simple erradicación de los focos enfermos por medidas preventivas, ofreciendo la quimioterapéutica en la actualidad una posibilidad relativa mayor de cura que la que existió hasta ahora. Esto puede efectuarse más pronto por la acción antibacilar de los ésteres del aceite de chalmugra o mugrol, preparatoria de la acción letal final de la estreptomicina, la sulfona y/o el ácido para-amino-salicí lico o una combinación de estos, que por el componente individual. Los estudios *in vitro* e *in vivo* substancian los resultados obtenidos clínicamente, que la rápida y actual reacción urinaria negativa permanente puede obtenerse mejor por la terapéutica sinérgica que por la antibiótica individual, así como la respuesta clínica a la misma es altamente satisfactoria, mucho más que con las medidas higiénicas o sanitarias prolongadas con la incapacidad económica consiguiente. La intervención quirúrgica está indicada solamente en el caso de que el organismo atacado se encuentre funcionalmente insuficiente en lo que atañe a viabilidad y recuperación, teniendo el carácter de suplementaria.

SUMARIO

A tuberculose do tracto urinario e uma doença crôica e devastadora de origem *hematogenica A simples erradicacão do* foco da doença fracassou no passado e a *quimioterapia oferece presentemente uma* possibilidade relativamente maior de cura A *quimioterapia pode ser mais* prontamente empreendida atacando o bacilo com os estrese de óleo de chaulmoogra ou moogrol, preparando os para a açao letal ulterior da streptomicina, ou sulfona e ou acido para aminosalicilico ou uma combinação destes, preferivelmente a uma ação unitaria Estudos *in vitro* e *in vivo* corroboram os resultados obtidos clinicamente em que a rapida e permanente reação negativa da urina e melhor obtida pela terapeutica sinergica do que pelos antibioticos isoladamente, evidenciam tambem que a resposta clinica aos mesmos e *altamente satisfatoria—mais expressi*vamente satisfatoria do que as obtidas com cuidados higienicos e medidas sanitarias, os quais são acompanhadas por um cortêjo de desvantagens

Relatorios sobre 103 casos pessoais ou *comunicados revelam que este triplice* ataque e presentemente o melhor metodo de tratamento A intervenção cirurgica e somente indicada si o organismo envolvido esta alem da sua viabilidade funcional e da sua capacidade de cura e, mesmo *assim, deve ser completada com o triplice* ataque terapêutico antes mencionado

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Correction

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Seccion en Espanol

Endarteriolitis Primaria Distal Necrosante

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EXISTEN publicados en la literatura médica casos de gangrena espontánea de los dedos que aparecen y se desarrollan sin las caracteristicas de las enfermedades arteriales oclusivas corrientemente aceptadas. Sorprende constator en las gangrenas que describimos, que las arterias pulsan normalmente hasta la periferia y que las oscilaciones estan conservadas y a veces paradojicamente aumentadas. La gangrena no va precedida de un período de claudicación intermitente. La enfermedad se inicia con dolor de tipo quemante en los extremos de los dedos que aumenta con la marcha o permaneciendo de pié e impide conciliar el sueño. A continuación suelen aparecer úlceras de localización periungueal accompañadas de intensa reacción inflamatoria periulcerosa que por último se tranforman en gangrena de uno o más dedos y en ocasiones en gangrenas de gran extensión como el caso que pasamos a describir que requirió la amputacion a nivel del tercio inferior del muslo.

En 5-V-47 acude a nuestro consultorio un enfermo de 65 años que padece úlceras extraordinariamente dolorosas en los dedos de ambos pies de localización periungueal preferente.

Relata la signuiente historia: A los 20 añnos, lúes correctamente tratada, manteniendose constantemente negatixa las reacciones serológicas. Hace 18 meses, sin claudicación intermitente previa, aparecen úlceras tróficas en los dedos de los pies que empeoran durante los inviernos. Tiene gran frialdad en las dos piernas y actualmente el dolor es tan intenso que le impide estar de pie y conciliar el sueño.

La exploración muestra: cianosis jaspeada bilateral del antepie, anestesia táctil del dedo gordo derecho, úlceras de localización periungueal en la mayor parte de los dedos de ambos pies.

El índice oscilométrico y el pulso periférico existen, incluso aumentados, en las dos piernas. Además de hiperoscilomentría se comprueba en las mismas, hipertensión. La presión arterial en la humeral derecha es 19/9,5. Presenta dilatación aórtica, hipertrofia del ventrículo izquierdo y alteraciones coronarias en el electrocardiograma.

Las reacciones serológicas de la lúes son negativas y no existen diabetes.

Se consiguió curar sus úlceras con inyecciones de Esplenhormón.

Un año más tarde, reaparecen con intenso dolor transformándose en gangrena a nivel del 1, 2 y 3 dedos del pie derecho. La explora-

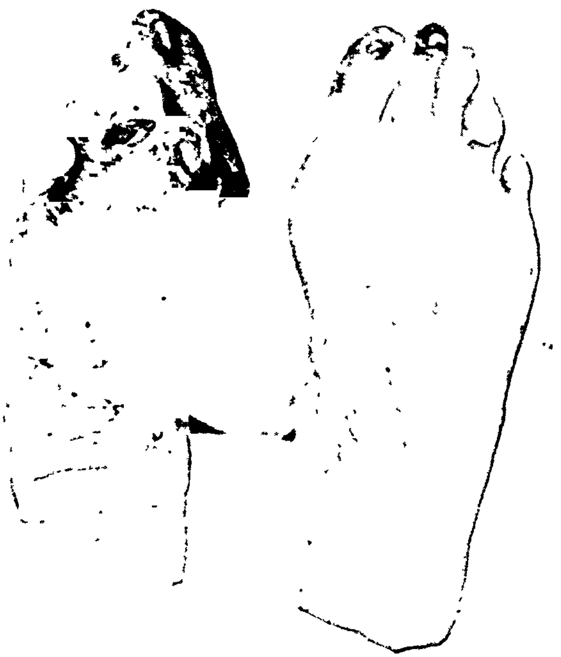

Fig. 1.—Gangrena del antepié derecho y de los dedos del pié izquierdo por endarteriolitis. A pesar de la gangrena el pulso de las pedias y tibiales posteriores estaba conservado.

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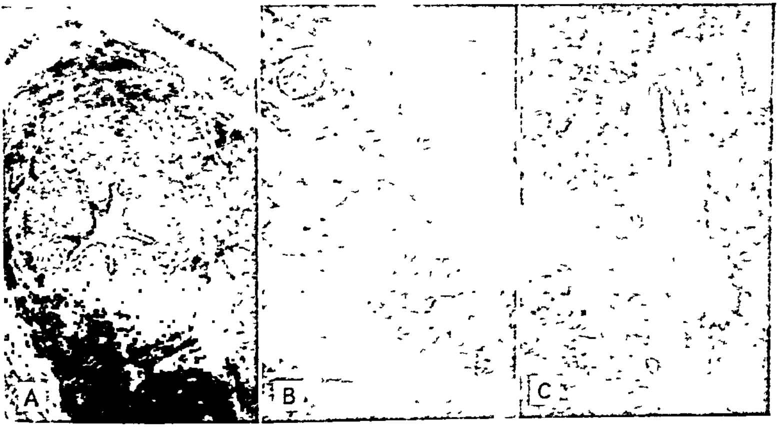

Fig. 2.—A, corte histológico de la arteria pedia [illegible] de la zona necrótica. La luz arterial aunque estrechada y deformada [illegible]. No existe trombosis. Acentuada endarteritis por proliferación celular de la íntima. B [illegible] grasa subcutánea del pie [illegible] eradas por [illegible] nol

ción vascular muestra los mismos síntomas. El pulso en la pedia y tibial posterior se mantiene perfectamente a pesar de la gangrena.

El 18-V-1948, se le practica una simpatectomía lumbar derecha que suprime el dolor, a nivel de los dedos.

A los pocos días, dolor y cianosis del antepie del lado no operado. Se le practica una anestesia del simpático lumbar.

Pocos días después, a pesar de conservarse el pulso en pedias y tibiales posteriores, se desarrolla una gangrena seca del antepie derecho (lado operado) y de los dedos del pie izquierdo (fig. 1).

El 27-VII-1948, se amputa en antepie derecho. La gangrena del muñon obliga a una amputación en el tercio inferior del muslo que se practica el 18-VIII-48. Llama la atención, en el acto operatorio, que la arteria femoral es permeable, dilatada e hiperpulsátil. Por el contrario, los vasos restantes, en su mayoría no sangran, debiendo colocar solamente tres ligaduras.

Algunos días después, el enfermo fallece a consecuencia de un ictus apoplético.

El examen histológico de la arteria pedia derecha que se mantuvo pulsátil a pesar de la progresión de la gangrena isquémica, muestra (fig. 2) un engrosamiento de la pared y una cavidad de forma estrellada como consecuencia de una intensa endarteritis obliterante. A pesar de la esclerosis de la luz vascular y de su deformación, la arteria es permeable y no existe trombosis. El examen histológico de las pequeñas arteriolas de la grasa subcutánea muestra en todos los puntos (figs. 3 y 4) en oclusión, no por trombosis, sino por proliferación de la íntima.

En un trabajo reciente, Fontaine y colaboradores describen site casos de esta enfermedad y se preguntan si se trata de una afección vascular autónoma electiva de las arteriolas periféricas o simplemente de una forma topográfica particular de las enfermedades arteriales oclusivas corrientes. En su opinión, parece admisible que esta enfermedad constituya una afección arteriolar primitiva que alcanzaría secundariamente a las arteriolas vecinas y sería de consecuencias tan graves como si se tratara de la oclusión de una arteria de gran calibre.

Kramer, en su Monografía "Peripheral Vascular Diseases" describe [illegible] de endarteritis obliterante, una enfermedad diferente de la tromboangeítis obliterante y de la arteriosclerosis obliterante. Resalta que la oclusión arterial tiene lugar en las arteriolas y que esta oclusión no se debe a trombosis o arteromatosis arterial, sino a una endarteritis con proliferación de los elementos celulares de la íntima. En febrero de 1950, insiste de nuevo sobre esta misma enfermedad, en la revista "Angiology."

En nuestro opinión la enfermedad que nos ocupa no constituye una simple forma topográfica de la arteriosclerosis o de la tromboangeítis, es una enfermedad diferente cuyas características esenciales son las siguientes:

1. Iniciación de la enfermedad en las arteriolas distales.
2. Obliteración de estas arteriolas por endarteriolitis (proliferación de los elementos celulares de la intima).
3. Isquemia de los extremos de los dedos que origina úlceras o gangrena de los mismos.
4. Estad úlceras o gangrenas aparecen sin claudicación intermitente previa.
5. El pulso periférico persiste normalmente hasta las partes más periféricas.
6. El índice oscilométrico es normal y con frecuencia aumentado.

No creemos acertado el término endarteritis obliterante para esta enfermedad ya que da origen a confusiones con la tromboangeítis. Es sabido que WINIWARTER dió aquel nombre a los primeros casos de tromboangeítis descritos en la literatura mundial. Creemos más acertado el término endarteriolitis primaria distal necrosante con lo cual se especifica su localización arteriolar, la obliteración por hiperplasia de la íntima, el desconocimiento de su etiología y la producción de graves lesiones isquémicas.

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Factores Hormonales En El Control Linfocitario

MANUEL A MANZANILLA, JR.*

MÉXICO D F MÉXICO

LOS linfocitos al igual que los demás elementos hemáticos, tanto biológicos como químicos, parecen tener en condiciones normales un margen cuantitativo de variación que tiene límites relativos; fuera de este margen la variación cuantitativa se considera como un dato significativo de modificación funcional o anatómica de los mecanismos que obrando sobre la producción y destrucción linfocitaría, mantienen el margen de variación considerado como normal.

Es interesante hacer notar que dichas variaciones linfocitarias han sido relacionadas con la producción de alfa, beta y gamma globulinas y con la formación de anticuerpos. Ehrich y Harris[1] encontraron que las linfoglándulas pueden participar en la producción de substancias antibacterianas y hemolisinas y que dichas linfoglándulas muestran hiperplasia de tejido linfoide; Loeb[2] considera que los linfocitos más que el retículo endotelio son los responsables de la producción de substancias inmunes, bacteriolisinas, hemolisinas y antitisulares, estas últimas producidas por los transplantes tumorales que por su individualidad orgánica diferencial actúan como antígenos.

Así pues, a los linfocitos y sus variedades numéricas se ha atribuido papel de mecanismo homeostásico, con fin y utilidad definidas en la defensa de la integridad anatómica y funcional del organismo.

Los mecanismos invocados como reguladores de las variaciones linfocitarias han sido muchos, sin embargo, por los caracteres de los linfocitos, células únicas circulantes, así como por los caracteres de los órganos que los producen, tales mecanismos han sido principalmente humorales.

Desde hace tiempo se ha observado, tanto clínica como experimentalmente, la influencia de diversas hormonas y de la composición química de la sangre sobre la cifra de los linfocitos, Hoff[3], en 1934, señaló los efectos del equlibrio ácido-básico, observando que la hiperventilación produce linfocitosis; por lo que respecta a las hormonas, como veremos despés, muchos investigadores han efectuado múltiples observaciones en casi todas las glándulas endócrinas, que establecen relaciones más o menos definidas entre el grado de secreción hormonal y el tipo de variación linfocitaria. Ahora bien, debido a que la acción de dichos mechanismos reguladores linfocitarios se encuentra estrechamente relacionada con la producción, excreción y destrucción de los linfocitos, haremos una breve relación de estos fenómenos antes de tratar de los mecanismos hormonales en particular.

Los linfocitos se forman normalmente en los tejidos linfoides del organismo, linfoglándulas, bazo, timo, amígdalas y placas de Peyer; se considera que los vasos linfáticos son la vía principal por la cual dichos elementos penetran a la sangre, si bien no es única ya que en la médula ósea pasan directamente a ella. El conducto torácico ha sido señalado como el vertedor principal, habiéndose observado que en su contenido los linfocitos son las células más abundantes (Yoffey;[4] Hall[5]), siendo mayor el número de estos que pasan por ducto torácico en un día que los en la sangre en un tiempo dado (Sanders, Florey y Barnes[7]) ; asimi obstrucción de dicho conducto linfopenia,[8] el propio efecto que abocamiento a la superficie corpor gun Drinker, 1938,[9] la mayoría células de la linfa del conducto to proceden del intestino, lo que se compr por las experiencias de Erf, 1940,[10] q demostró que la gastroenterectomía conejos produce una linfopenia que no aumenta por la extirpación posterior tejido linfático restante; sin emba algunos autores (Kindred;[11] Andreasen[12]) piensan que no se puede considerar al conducto torácico como el órgano principal de excreción. En cuanto a la destrucción linfocitaria, de las experiencias de Yoffey, 1933[6] y Sanders, 1940[7] se colige que la vida de los linfocitos es muy corta, siendo remplazados de ½ a 3½ veces en 24 horas.

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EFECTO TIROLINFOCITARIO

Zondek y Koehler, en 1928,[13] encontraron que pequeñas dosis de tiroxina producían variaciones numéricas en los linfocitos circulantes, Potrowsky comunicó que la tiroidectomía en perros hacía desaparecer a los pequeños linfocitos de la circulación, inversamente a la administración de extractos tiroideos que producían aumento y Elmaidjan, en 1948,[14] observó que la hormona tirotrófica hipofisiaria ocasiona linfocitosis en ratas normales o suprarrenalectomizadas, siendo incapaz de producirla en tiroidectomizadas. Por otra parte, clínicamente se ha observado con frecuencia una linfocitosis en el hipertiroidismo (Crotti;[15] Hertzler;[16] Williams;[17]) variación linfocitaria que ha sido considerada por algunos autores[15] como índice pronóstico y que desaparece el mismo día de practicarse la tiroidectomía.[15] Sin embargo, dicha linfocitosis del hipertiroidismo ha sido atribuida a una disminución de la actividad córtico-suprarrenal, ya que la corticosterona produce linfopenia y en dicho padecimiento se encuentra una disminución en la excreción de 17 cetoesteroides y cortina.[17]

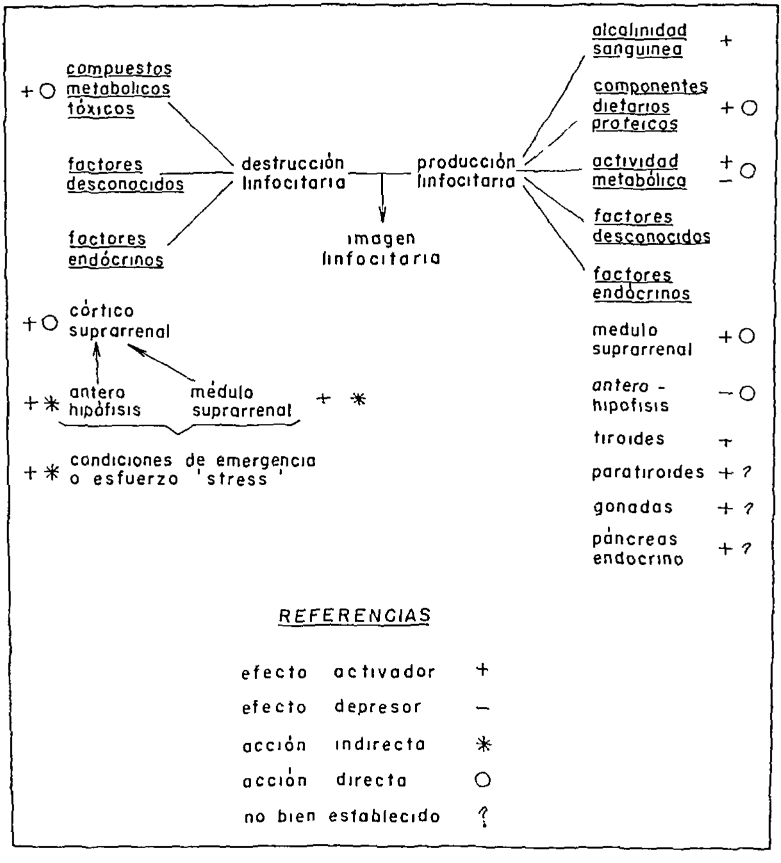
De lo anterior se deduce que, aunque no se puede afirmar en sentido absoluto, parece que las variaciones de función tiroidea tienen efecto sobre la cifra de linfocitos circulantes, modificándola de acuerdo con la relación hiperfunción tiroidea-linfocitosis e hipofunción tiroidea-linfopenia.

EFECTO SUPRARRENOLINFOCITARIO

Por lo que se refiere al efecto linfocitario de la glándula suprarrenal, es necesario considerar separadamente los efectos de la médula de los de la corteza.

Médula.—Desde hace tiempo se ha observado que en diversas especies animales y en el hombre la administración de adrenalina produce variaciones númericas linfocitarias, así en los animales se ha observado linfocitosis (Benhamou;[18] Yang;[19] Benhamou;[20] Jung y Collet;[21] Garrey y Bryan;[22] Drury[23]); el mecanismo de dicha linfocitosis varía segun los autores, pero la mayoría coinciden en ciertos aspectos. Algunos consideran que la linfocitosis adrenalínica se produce independientemente de la presencia del bazo (Benhamou;[18] Yang;[19] Jung y Collet;[21] Martin;[24] Bonano[25]) sin embargo, recientemente Drury, 1950,[23] ha atribuido papel indispensable a este órgano, refiriendo que no se produce dicho fenómeno en los animales esplenectomizados, estableciendo también este autor que el mecanismo de la linfocitosis adrenalínica es por estimulación de la pulpa blanca del bazo por la adrenalina. Por otra parte, se ha demostrado que la adrenalina produce aumento de la excreción de linfa en la sangre (Davis y Carlson;[26] Rous;[27] Haynes;[28] Lamson y Roca[29]; Chistoni[30]), por lo que se cree que dicha linfocitosis adrenalínica se debe en gran parte a este fenómeno, sobre todo si se tiene en cuenta que, como mencionamos anteriormente, parece que el conducto torácico es el principal vertedor de linfocitos en la sangre; asimismo Martin, 1932,[24] ha observado que la adrenalina produce contracción del músculo liso de las linfoglándulas, lo que según este autor es un dato de tomarse en consideración en la producción de la linfocitosis adrenalínica.

En el hombre, Hortling y Pekkarinen, 1949,[31] han encontrado que la adrenalina produce una linfocitosis pasajera y posteriormente una linfopenia más acentuada y duradera, mismos datos que refieren Recant, Hume, Forsham y Thorn, 1950,[32] quienes han observado además que dicha curva bifásica no se modifica por la administración previa de ACTH, contrariamente a lo que acontece con la curva adrenalínica de los eosinófilos circulantes. Finalmente, mencionaremos que Lucia, Leonard y Falconer, 1937,[33] solamente ob-



Factors hormonales y metabolicos en el control linfocitario

tuvieron linfocitosis por la administracion de adrenalina, asimismo refieren que la esplenectomia en el hombre no modifica esta respuesta

Resumiendo, podemos decir que en los animales la adrenalina produce linfocitosis y en el hombre ademas de esta linfocitosis se produce una linfopenia consecutiva Para poder estimar el mecanismo por el cual la adrenalina produce estos tipos de respuesta es necesario tener en cuenta la observacion de Vogt, 1944,[34] confirmada por Paschkis y colab, 1948,[15] quien demostro *un aumento de hormona cortical en la* sangre de la vena suprarrenal del perro recién decapitado al que se le había administrado adrenalina, lo cual sugiere una acción directa estimulante de la adrenalina sobre la secreción cortical; además, Long y Fry, 1945,[36] estudiando esta respuesta de la córticosuprarrenal a la adrenalina encontraron, mediante el reactivo de Sayers y Sayers, 1946,[37] un aumento de ACTH producido por la adrenalina en las ratas normales que no se producía en la hipofisectomizadas. De esto Long, 1947,[38] postuló la mediación hipofisiaria en la excitación córticosuprarrenal por la adrenalina, la cual había sido obtenida también por Vogt, 1945,[39] Así pues, la adrenalina produce tanto directamente por estimulación cortical como indirectamente por hipofisiaria un aumento de la secreción de la corteza suprarrenal, la cual como ha sido demostrado por varios investigadores produce linfopenia. (Dougherty y White;[40] Dougherty y White;[41] Nichols y Miller;[42] Morros Sarda;[43] Shapiro y Schetman[44]).

Ahora bien, ya que en los animales Drury, 1950,[23] ha demostrado que la linfocitosis adrenalínica se produce más notablemente cuando existe menos tejido córticosuprarrenal y por otra parte se ha observado que la adrenalina aumenta el aflujo linfático a la sangre, creemos que en tratándose de animales, la respuesta linfocitaria adrenalínica se explica por el efecto de esta sobre los vasos linfáticos, teniendo poca significación su acción estimulante sobre la corteza suprarrenal, no pudiéndose descartar sin embargo el que pudiera existir participación de esta, enmascarada por el efecto sobre los vasos linfáticos de acción contraria.

En el hombre nos inclinamos a pensar que la curva bifásica mencionada se encuentra condicionada por dos factores: (1.)—la linfocitosis por el efecto inmediato de la adrenalina sobre los vaos linfáticos y (2.)—la linfopenia consecutiva por el efecto mediato de la adrenalina sobre la secreción cortical, tanto directo sobre la corteza como a través de la hipófisis, produciendo ACTH que a su vez aumenta la secreción cortical y repercute sobre la cifra linfocitaria, tal como lo ha demostrado Hungerford, 1949.[45]

De lo anterior concluimos que la respuesta a la adrenalina, independientemente de interacción hipofisiaria-suprarrenal, consiste en una linfocitosis, que de acuerdo con el conocimiento actual se debe principalmente a aumento del aflujo linfático a la sangre. Asimismo, parece existir la relación hipofunción medular-linfopenia, de acuerdo con la observación de que la reducción del sistema cromafín produce dicha variación linfocitaria,[46] pero esto no ha sido comunicado por otros investigadores.

Estados emocionales.—Los estados emocionales pueden ser considerados como fenómeno fisiológico suprarrenal, principalmente medular de acuerdo con Cannon, 1941.[47] Dichos estados producen variaciones en la cifra de linfocitos, habiéndose comunicado en la literatura que la ansiedad, el miedo, la decepción, etc. producen en el hombre una linfocitosis,[48] que según Kreezer, 1949,[49] puede estimarse como un indicador de la magnitud de la reacción emocional. Asimismo, se ha observado dicha linfocitosis emocional en la rata albina con magnitud promedio de 12.08%, que no se produce en ratas suprarrenalectomizadas.[50]

Por la índole de las experiencias expuestas y teniendo en cuenta las consideraciones antes mencionadas sobre los efectos de la adrenalina, podemos estimar que los estados emocionales producen una linfocitosis, indicando respuesta de tipo medular con poca interacción endócrina que determine aumento de secreción cortical.

Corteza.—La administración de hormona suprarrenotrófica hipofisiaria así como corticosuprarrenal produce en diversas especies animales y en el hombre cambios sobre el tejido linfoide y linfocitos circulantes, Szego y White, 1949,[51] y White y Dougherty, 1947,[52] han observado involución de dicho tejido, que también se presentó en los pacientes con leucemia linfática de Stickney, Heck y Walkins, 1950,[53] que fueron tratados con ACTH y en las experiencias en ratones con leucemia linfática de Law y Speirs, 1947,[54] tratados con extracto corticosuprarrenal

Por lo que respecta a las variaciones en los linfocitos circulantes, en los animales se produce linfopenia absoluta por la administracion de hormona ACTH (Dougherty y White,[40] Reinhardt, Yoffrey y Baxter [1]) mismo efecto que se ha observado con los preparados corticosuprarrenales (Dougherty y White,[41] Dougherty y White,[41] Nichols y Miller,[4] Morros Sarda[4], Schapiro y Schetman[44]), en los que se ha demostrado que son principalmente los esteroides oxigenados en posicion 11 los que ejercen el efecto linfopenico mas marcado, no siendo efectiva la desoxicorticosterona, en contraste con la cortisona, compuesto F de Wintersteiner, E de Kendall y otros esteroides de este tipo quo la producen (Dougherty y White,[40] Thorn[…]) Tales linfopenias de la ACTH y de las hormonas corticosuprarrenales han sido observadas tambien en el hombre normal (Dougherty y White,[4] Forsham,[45] Herbert y De Vries, Hills) y en el addisoniano,[1] habiendo atribuido Thorn, Forsham, Prunty, Bergner y Hills, 1949 a la linfopenia producida por la ACTH valor como prueba de funcionamiento suprarrenal Inversamente a los efectos de la administracion de ACTH y compuestos corticosuprarrenales, la supresion de la glandula suprarrenal determina tanto en los animales como en el hombre aumento de la cifra de linfocitos circulantes (Zwemer y Lyon,[13] Waterman,[14] Corey y Britton, White y Dougherty[16]) Asimismo, en relacion con las modificaciones linfocitarias producidas por las variaciones funcionales suprarrenales, se ha observado paralelismo entre el grado de excrecion de cetoesteroides en la orina y las variaciones linfocitarias diarias (White y Dougherty,[16] Elmaidjan y Pincus)

Ahora bien, clinicamente se han efectuado observaciones que confirman la relacion experimental hiperfuncion cortical-linfopenia e hipofunction cortical-linfocitosis, encontrandose linfocitosis moderada en la enfermedad de Addison (De la Balze,[18] Rolleston[19]) en la que la excrecion de cetoesteroides se encuentra invariablemente disminuida, en tanto se presenta linfopenia en el sindrome de Cushing (De la Balze,[18] Levine [1]), en el que existe aumento en la excrecion de cetoesteroides

Resumiendo, podemos decir que tanto experimentalmente como por la clinica existe evidencia de la influencia que tienen la ACTH y los compuestos corticosuprarrenales sobre los linfocitos circulantes y que tal influencia se encuentra en la relacion hiperfuncion cortical linfopenia e hipofuncion cortical-linfocitosis, sin embargo, es de pensarse que esto no es tan absoluto, ya que otros autores no han observado alteraciones hematologicas especificas referidas a la accion directa de las hormonas corticosuprarrenales sobre el tejido linfoide -

Ahora bien, por lo que respecta al mecanismo de la linfopenia corticosuprarrenal, poco se sabe en lo que concierne al vivo, sin embargo, se sabe que los esteroides corticosuprarrenales no actuan directamente sobre los linfocitos produciendo su lisis, ya que dichos esteroides no tienen influencia sobre los linfocitos en sangre in vitro[74] o en suero homologo diluido Por otra parte, en la sangre perfundida del bazo aislado de conejo, Hechter y Johnson, 1949, han notado aumento en el poder de disolucion de los linfocitos con los esteroides corticosuprarrenales, asimismo, se ha observado que la 11-dehidrocorticosterona y la 11-dehidro, 17-hidroxicorticosterona aumentan la degeneracion linfocitaria en los cultivos tisulares linfoides, principalmente en la zona limite de los ganglios, considerandose que la presencia de tejido linfatico es constituyente primordial en la destruccion de los linfocitos in situ

Dougherty y White, 1944, comunicaron un aumento de proteinas totales en la rata como fenomeno asociado a la linfolisis corticosuprarrenal, que se debe a la aparicion de globulinas beta y gamma procedentes de la destruccion linfocitaria (White y Dougherty,[80] Kass[81]) , asimismo, el aumento de la actividad corticosuprarrenal se acompaña de uraturia, la cual se atribuye a la misma destruccion linfocidea.[82] Gjessing y Chanutin, 1947,[83] comunicaron aumento de globulinas alfa y beta por la administración de hormonas córticosuprarrenales; sin embargo, otros investigadores no han observado dichos efectos en las mismas especies animales (Li y Reinhardt;[84] Eisen[85]), ó en el hombre.[72]

Además del efecto linfolítico periférico córticosuprarrenal, se tiene conocimiento de que las hormonas corticales y los estrógenos poseen grupos fenólicos ó quinonas en su constitución, que en altas concentraciones son tóxicos para las células hematopoyéticas.[86]

Finalmente, se ha demostrado que la inyección de ACTH disminuye el número de linfocitos en el conducto torácico en más de un 50%, cosa que no sucede en los suprarrenalectomizados.[87] Sin embargo, otros autores no han observado dicho fenómeno (Valentin;[88] Craddock[89]).

Así pues, de lo anterior podemos decir que la secreción córticosuprarrenal produce linfopenia, en tanto la supresión ó la disminución de la misma se acompaña de linfocitosis y que la linfopenia se debe al efecto linfolítico de 11, 17 oxiesteroides.

Condiciones de esfuerzo, "Stress".—Entre los cambios morfológicos y funcionales característicos del síndrome general de adaptación, se encuentra la hipertrofia córticosuprarrenal, el aumento de corticoides y la involución tímico-linfática. Tal relación establecida por Selye, 1949,[90] se comprueba en cierta forma en múltiples circunstancias que implican una condición de esfuerzo para el organismo, así se ha observado la producción de linfopenias por la fatiga (Graham;[91] Elmaidjan y Pincus;[92] Pincus y Elmaidjan;[93] Hoagland, Pincus y Elmaidjan[94]) y otros estímulos, algunos más lesionantes como anoxia,[95] inanición,[96] quemaduras,[97] toxinas bacterianas,[98] intoxicaciones por arsénico (Halter;[99] Beitschusger[100]), rayos röntgen (Henshaw[101] Henshaw;[102] Henshaw[103] Dunlap[104]), y otros más que como se sabe activan la secreción córticosuprarrenal (Selye;[90] Selye;[105] Selye;[106] Sayers[107]); por otra parte, Elmaidjan y Pincus, 1945,[92] han señalado que dicha linfopenia de esfuerzo no se presenta en los animales suprarrenalectomizados, lo que confirma dicha participación de la secreción córticosuprarrenal. Finalmente, es interesante mencionar que Selye ha incluido en su grupo de enfermedades secundarias debidas a respuesta endócrina excesiva al estímulo, a la involución accidental del timo, así como algunos tipos de tonsilitis.

Por la índole de las experiencias y observaciones expuestas podemos considerar que las condiciones de esfuerzo, "stress", producen una linfopenia indicadora del tipo de respuesta principalmente córticosuprarrenal, pues aunque en muchas de esas condiciones se ha observado secreción de adrenalina, esta produce el mismo efecto mediante la estimulación hipofisiaria córticosuprarrenal.

OTROS EFECTOS ENDOCRINOLINFOCITARIOS

Se han comunicado observaciones sobre variaciones linfocitarias producidas por otras glándulas aparte de las mencionadas. De dichas observaciones no se pueden obtener relaciones más o menos constantes debido a las pocas experiencias consignadas en la literatura, pero mencionaremos aunque sea aisladamente los datos encontrados.

Paratiroides.—Tramontan y Scala, 1941,[108] refieren que las glándulas paratiroides estimulan la linfopoyesis.

Gonadas.—Andreasen, 1946,[109] demostró diferencia sexual en el tamaño de las linfoglándulas y bazo en cuyes y Tramontan y Scala, 1941,[108] han enunciado que las gonadas aumentan la linfopoyesis. *Páncreas endócrino.*—Kober comunicó en 1931,[110] la producción de linfocitosis por la insulina, pero no existe acuerdo en lo que atañe a este efecto.[111] Nosotros pensamos que es difícil diferenciarlo del adrenalínico, ya que Cannon y colab., 1924,[112] demostraron la liberación de adrenalina durante la hipoglucemia insulínica.

COMENTARIOS

¿ Cuál es el mecanismo del mantenimiento del nivel linfocitario?, ¿ Hasta

donde el sistema endocrino constituye mecanismo de la regulacion linfocitaria? La contestacion a estas preguntas aun no es clara Sin embargo, es evidente por todo lo que se ha venido exponiendo en el curso de este artículo, que en muchas circunstancias los cambios funcionales endocrinos son los responsables de la produccion de variaciones linfocitarias y aunque el mecanismo de dicho mantenimiento del nivel linfocitario habitual no se conoce con certeza, parece que este depende en gran parte de la actividad endócrina particularmente de la corticosuprarrenal, como se deduce de la observacion de Elmaidjan y colab 1946,[66] quienes obtuvieron paralelismo entre las modificaciones linfocitarias diarias y la determinacion urinaria de cetoesteroides Asimismo, parece que en tratandose de cuadros patologicos las variaciones linfocitarias pueden ser un indicador de variación funcional endocrina, pero es de mencionarse que la cifra linfocitaria, tomada como tal, solo constituye una gruesa aproximacion a causa de la complejidad de los sistemas reguladores como un todo, pues solamente de acuerdo con los conocimientos actuales se puede estimar como indicador con cierto margen de probabilidades en los padecimientos de tiroides y corticosuprarrenal, ya que solo con estos dos organos se ha establecido experimental y clinicamente una relacion mas o menos definida entre las variaciones linfocitarias y el grado de secrecion glandular Por otra parte, las modificaciones linfocitarias en circunstancias fisiologicas de emergencia ó esfuerzo, "stress", pueden ser expresion de actividad homeostasica que implica variacion funcional endocrina, preferentemente medulo y corticosuprarrenal, con referencia a esto es interesante hacer notar que inversamente a los demas integrantes del medio interno en los cuales se considera que la produccion de una variacion cuantitativa indica un deficit homeostasico,[47] en el caso de los linfocitos la variacion de acuerdo con su indole indica la capacidad del sistema homeostasico eliminando la posibilidad de deficit, pero esto hay que considerarlo de acuerdo con lo expuesto en los parrafos referentes al efecto medular y cortical suprarrenolinfocitario Finalmente, el sistema endocrino y la cifra linfocitaria parecen tener una estrecha relacion, que valorada adecuadamente puede ser de gran utilidad

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The United States Chapter of the International College of Surgeons

announces the creation of Junior Membership in the College The House of Delegates, meeting on Dec 18, 1949, established this new form of membership, with the following requirements

One year of internship in an approved hospital

One year as resident surgeon in a specific surgical training program

For further information, address

Secretary, International Board of Surgery

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An Odyssey to Rome, Florence and Paris

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ON the twenty-eighth of April nearly a hundred members of the United States Chapter of the International College of Surgeons, bound for the recent continental assemblies in Florence and Paris, arrived at the Waldorf-Astoria in New York for a preliminary social meeting with the New York Surgical Section of the College. Officially the College was represented by its Founder, Dr. Max Thorek; its President, Dr. Herbert Acuff; the President of its United States Chapter, Dr. Henry W. Meyerding, and by myself, the Secretary of the United States Chapter. Prof. Dr. Francisco Graña of Lima, Peru, former president of the International College, met us in Chicago to accompany us to Europe.

Our brief visit in New York was delightful; several group dinner parties were held that evening, and on the following day most of the members attended a luncheon in the famous Norse Grill.

We flew to Europe in two huge double-decker planes, one going by way of London and the other direct to Paris. Ten hours from the time we took off we saw the coast line of France through a break in the clouds, and in a few moments its sunny farms and vineyards and the red-tiled roofs of its villages lay beneath us. We landed at the Orly Airport on the outskirts of Paris, having completed the flight of 3,420 miles in about thirteen hours and a half.

After an hour's stop and a change of crew, we resumed our flight to Rome. This was a matter of only four hours' time. We crossed the Alps in the brilliant glow of sunset, and just at dusk our plane headed out over the Mediterranean.

Arrived at Rome, we were met by friends and conducted to excellent quarters at the Hotel Excelsior. At 9 o'clock next morning Dr. Galeazzi Lisi, physician to the Pope, called for Dr. Thorek, Dr. Graña, Dr. Acuff, Dr. Meyerding and myself and attended us to the Vatican, where we were graciously received by Pius XII. The prelate showed warm interest in the purpose of the College, particularly commending its international scope and its potentiality as a working force toward peace and global understanding. We were shown the Sistine Chapel, the King's Room, and the Red and Gold Room in which members of the Embassy are received.

Space does not permit an adequate description of the ancient glories of Rome, familiar already from legend, song and story but none the less stirring. The magnificence of St. Peter's, the melancholy spell of the Catacombs, and the visions of Roman conquest called forth by the Appian Way can be imagined. We saw, of course, the Colosseum, the Capitol, the Forum, the Arch of Constantine, the Pantheon, and that later historic landmark, the platform from which Mussolini addressed the people. We paid due tribute to Rome's matchless treasures in sculpture and painting.

In lighter mood we visited the famous old Orso's restaurant and other well-known cafes, including the Restorante Passetto, where our officers were entertained by Prof. Dr. Raffaele Paolucci, eminent Italian surgeon and hero of World War I. Prof. Paolucci is an enthusiastic member of the College. At this luncheon we also met Dr. G. Bendandi and his charming wife, who expect to be with us in Chicago for the coming Assembly in September. We were also delightfully entertained by Prof. and Mrs. Raffaele Bastinanelli in their beautiful home.

May 3 was Ascension Day, a national holiday, and we drove toward Florence

Dr. Arnold S. Jackson, Secretary, United States Chapter, International College of Surgeons, addressing the Paris Assembly.

through rolling green wheat fields, vineyards, olive groves and plateaus dotted with ancient villages and castles. Wherever we went in Italy we were warmly and delightfully received, not only by our professional confreres but by the people in general.

Our road crossed the Tiber several times en route to Florence. We stopped at Perugia for luncheon and rested before proceeding to Florence. In Florence we again had attractive quarters at the Grand Excelsior Hotel, looking down on the river, only one of whose bridges, the historic Ponte Vecchio, was spared by the Nazis.

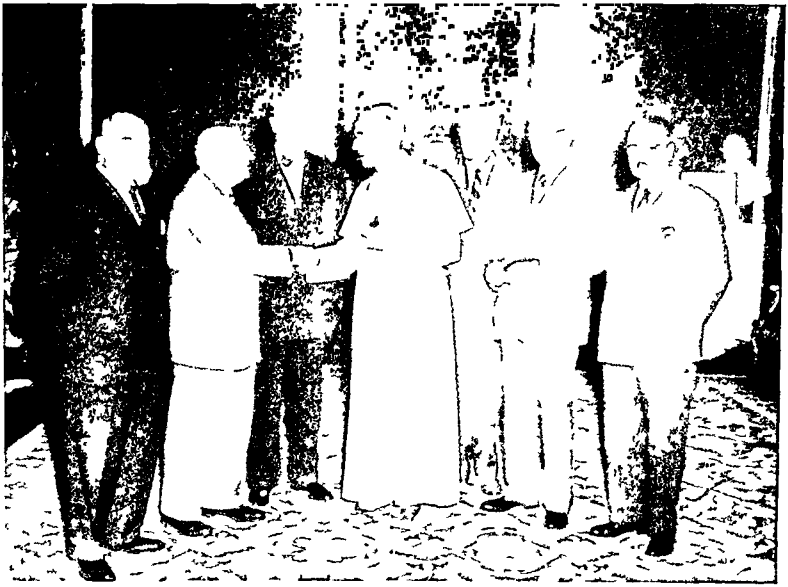
Early next morning we went to the Palazzo della Signoria, our meeting place, to register. The first immense hall of this palace was built by Cronaca in 1495. The frescoes on its walls represent battles and triumphs of the Medics. In these surroundings, mellow with tradition and rich with masterpieces of ancient and medieval art, our modern scientific discussions were to take place. There was a certain dreamlike quality in the contrast, especially as the assembly was called to order by gaily clad trumpeters in the costume of the Middle Ages, sounding the call on their long shining trumpets. After a cordial welcome from the Mayor and other officials the meeting was briefly adjourned for a social interval. At 4 p.m., with about 250 European and forty American surgeons participating, the conference went into action. The presentations were made in English, Italian, French and German, with able translation available when required.

The next few days were busy ones indeed. In Florence, the cradle of the Renaissance, we found ourselves again in the midst of a bewildering array of historic and artistic marvels—the Medici chapel, the Baptistry, the Campanile, the Pitti Gallery, the fascinating shops with their fabulous tooled leather, handcrafted silver and exquisite linens. Here, as elsewhere in Italy, we were cordially welcomed and aided in every way. On May 5 a bus trip to Pisa completed a happy and profitable day. We journeyed through a countryside of incredible loveliness, despite occasional ruins and craters of war. In Pisa we visited not only the famous tower but the cathedral where Galileo framed his laws.

On the following day we returned to Rome by train, accompanied by Prof. Francisco Martín Lagos of Madrid, discussing on the way our plans for the Eighth International Assembly of the College in that city next May. There is every indication that this will be a truly great affair, attended by surgeons from all over the world.

On our return to Rome, the Italian Ambassador to Peru gave a sumptuous dinner, attended by members of the Embassy and a large group of "Congressists" (the local term for those attending a meeting). At 2 p.m. next day we left by plane for Paris by way of Zürich. Over Switzerland the plane flew low enough to afford a clear view of the mountains, green forests, chalets, winding rivers and picturesque lakes and villages. Within an hour we sighted the Eiffel Tower and the lights of Paris; landing, we were lodged at the George V Hotel and the Prince of Wales, both located within two blocks of the Champs Elysees.

Dr. Elmer Henderson, President, American Medical Association, speaking at the banquet in Paris.



Private audience with Pope Pius XII From left to right Prof Francisco Grana, Past President, International College of Surgeons, Dr Max Thorek Founder of the College, Dr Herbert Acuff, President, Pope Pius XII, Dr Arnold Jackson, Secretary, United States Chapter, Dr Henry Meyerding President, United States Chapter, Prof Galeazzi Liso, personal physician to the Pope

In Paris we devoted our mornings to surgical clinics, our afternoons to sightseeing and our evenings to relaxation Several of us visited the clinic of Dr Paul Banzet, who was a guest speaker at our Atlantic City meeting in 1949 Dr Banzet is famed for the remarkable speed and effectiveness of his operations, many of which he performs with no surgical nurse and no second assistant On another occasion we visited the Hotel St Louis, one of the oldest hospitals in France, in which the clinic of Prof Jacques Mialaret is located, and observed his technic of gastric surgery We also visited a private hospital operated by Dr Thalheimer, who received us with great courtesy and hospitality and who also invited us to watch him operate He demonstrated an ingenious electrical unit from which he could obtain a cautery, a suction apparatus and several other devices

Another clinic on our visiting list was that of Prof Lucien Leger, a brilliant young surgeon who is rapidly rising to fame He has recently developed an operative technic in which he incises the duodenum and injects lipiodol into the duct of Wirsung, after which he takes a roentgenogram This procedure enables him to ascertain whether calculi, diverticula or malignant disease is present

From May 9 to the 12 inclusive, surgical clinics were given by Drs Cauchoix, Dufour, Mathey, Judet, Rudler, Aboulker, Masmonteil, Oudet, Desvignes, Merle d'Aubigne, Sénéque, Gouverneur, Offret, Olivier, Sicard, Ducroquet and others. The social functions were equally brilliant.

Only brief mention can be made of our scenic tours in France, which included trips to Versailles, Fontainebleu, the Louvre, Napoleon's tomb, and Notre Dame. The same applies to our modest excursions into the night life of Paris. Our prime objective, after all, was not entertainment or sightseeing or even surgical clinics. We were there for the principal purpose of helping our French colleagues to establish a French Chapter of the International College of Surgeons. At the invitation of Prof. Dr. Raymond Darget, professor of clinical urology at the University of Bordeaux, and a group of other French surgeons, a party was given on May 9, as an introductory affair, and on the evening of May 11 a banquet was given at the beautiful Cercle Interallies. This was a gala affair, attended by approximately 200 surgeons and their wives. Among the distinguished guests were Drs. Elmer Henderson and R. L. Sensenich, president and past president, respectively, of the American Medical Association. They and Dr. Malcolm T. MacEachern, director emeritus of the American College of Surgeons, had flown over from Geneva, where they were attending the World Health Conference. Prof. Lagos of Madrid and General Lawrence Whiting of Chicago were also in attendance, as were several other eminent surgeons from the British Isles, the Netherlands and Italy. About fifty American surgeons and many French surgeons were present, among the latter were Dr. Jacques Mialaret, Chief of Surgery at St. Louis Hospital; Prof. Dr. Lucien Leger, brilliant young surgeon and editor; Dr. Thalheimer, who has just built one of the most modern operating rooms in Europe, with a remarkable illuminating system; Dr. Marc Iselin, Dr. Neal Rogers, surgeon to the American hospital; Prof. Portman of Bordeaux, Prof. Plichet, editor of *La Presse Medical,* and many other notables. Addresses were given by Drs. Darget, Portman, Leger, Chapchal, Brailsford, Acuff, Jackson, Graña, Lagos, Henderson, MacEachern and others. Dr. Thorek's address was given in French, and he received a hearty ovation.

Our trip home was made without incident; our party, however, was reduced considerably because a number of surgeons stayed on to visit other countries. We returned as we had come, by air, stopping for breakfast in Ireland, luncheon in New York and dinner at home. The trip was an unforgettable experience even for those who frequently visit Europe, since travel in ancient lands is always new; and to all of us alike our journey ended in a deeper realization of the intrinsic power of the College ideal to draw together men of all nations in sympathy and basic understanding. Speaking for myself, I saw as never before how genuine and how profound is the universal longing for peace and amity among surgeons, and how important it is that each of us shall recognize his own responsibility thereto. These are no times for self-seeking and self-aggrandization. Only as we realize what the College can mean to men of other nations as well as to ourselves shall we succeed in bringing it to its full development. And the continuing development and success of the College is, in a very real sense, part and parcel of the growth of freedom, to which we should be and are committed.

Chapter News

International College of Surgeons

United States Chapter

Arnold S Jackson, MD FACS FICS, Secretary

Assemblies in Europe: The recent Assembly of the Italian Chapter in Florence and the organizational meeting of the International College and its new French Chapter in Paris were even more notably successful than had been anticipated They were attended by nearly a hundred surgeons from this country, representing a good proportion of the states from coast to coast The most cordial welcome was accorded our representatives in both Italy and France, and a great deal was accomplished at both meetings toward cementing international friendship and the interchange of ideas A full account of the trip and its high points of interest will be found on Page 782

The scientific programs of the two meetings, both carried out at a remarkably high level of interest, efficiency and brilliant presentation, are here appended

Italian Program

Dr Bernard J Ficarra, Brooklyn *Indications for Thyroid Surgery in the Aged*

Dr Everett J Gordon, Washington *Stellate Ganglion Block in the Treatment of Acute Subdeltoid Bursitis*

Dr Arnold S Jackson, Madison *Modern Concepts of Thyrotoxicosis*

Dr Philip Thorek, Chicago *Supra aortic Esophagogastrostomy for Carcinoma of the Midportion of the Esophagus*

Prof Galeno Ceccarelli, Padua *Pericardectomy in Pick's Disease*

Prof G E Konjetzny, Hamburg *Mastopathy and Carcinoma of the Breast*

Prof A Lezius, Hamburg *Surgical Handling of Valvular Disease of the Heart*

Prof Giancarlo Parenti, Ferrara *Diagnosis and Surgical Therapy*

Prof Giancarlo Forni, Bologna *Benign Tumor of the Esophagus*

Drs C Mauro and B Piccioli, Naples *Plastic Tracheal Procedure with Polyethylene Tube*

Dr A Scheicher, Monaco di Baviera *Intratracheal Struma*

Dr Samuel L Governale, Chicago *Bone Grafts in the Treatment of Inguinal Hernia*

Dr Ralph Ringo Coffey, Kansas City *A New Anatomical Approach to the Repair of Inguinal Hernia*

Prof Giancarlo Peracchia, Brescia *On the Technic of Extirpation of Lipoma*

Prof Ferdinando Truini, Marino *Pathogenesis of the Abdominal Pain Syndrome in Pleuropneumopathy*

Prof Umberto Borghetti, Milan *Total Colectomy for Dolichomegacolon*

Dr Arturo Ruggiero, Naples *Use of Tantalum Mesh in Plastic Abdominal Procedures for Laparocele*

Dr Moses Behrend, Philadelphia *Surgery of the Bile Passageways its Pitfalls and their Prevention*

Drs B Piccioli and C Mauro, Naples *The Use of Polyethylene in Surgery of the Biliary Ducts*

Dr Raymond Darget *Malignancies of the Bladder*

Dr George B Callahan, Downey *Surgery for Ruptured Spleen in the Newborn*

Prof Giovanni Cavina, Florence *Chronic Traumatic Subdural Hematoma*

Prof Dr Francisco Graña, Lima *Trephining Procedures in Ancient Peru*

Profs Felice Visalli and L Martino, Rome *A New Approach to Puncture of the Ganglion of Gasser*

Prof Carl Reimers, Wuppertal *The Role of Cartilage in Hernia of the Discs*

Prof Ferdinand May, Munich: *Surgical Evacuation of the Bladder with Spinal Anesthesia*

Dr Charles A Hoffman, Huntington. *The Problem of the Female Bladder with Normal Urine*

Dr Richard Lawler, Chicago *Homotransplantation of the Human Kidney*

Dr Harold E Smith, Maywood *The Obstetrical and Gynecological Problems of the Urinary Bladder*

Prof Leonida Beluffi, Pesaro *Comparative Evaluation of Suprapubic and Retropubic Prostatectomy in the Treatment of Hypertrophy of the Prostate*

Prof Ferdinando Truini, Marino. *Retropneumoperitoneum in Renal Surgery*

Prof. Franco de Gironcoli, Trieste: *Disappearance of a Vesical Tumor After Ureterosigmoidostomy*

Dr. Donald P. Atkinson, San Antonio: *The Surgical Approach to Glaucoma*

Dr. W. O. Lodge, Halifax: *Transantral Technic*

Profs. Giovanni D'Errico and L. Piscatelli, Naples: *Arteriography: Experimental and Clinical Results*

Prof. G. Küntscher, Schleswig: *Medullary Nailing Technic*

Dr. Gustav Engler, Panama: *Bone Lesions in Tertiary Yaws*

Prof. Kurt Herzog, Düsseldorf: *Rigid Nail Technice for Fracture of Tibia*

French Program

Dr. Cauchoix: *Orthopedic Operations*

Dr. Banzet: *Gastrectomy and Other Surgical Procedures*

Dr. Dufour: *Urologic Operations*

Dr. Mathey: *Pneumonectomy*

Dr. Judet: *Pseudarthrosis of the Femur Acrylic Head for Coxarthritis Osteomyelitis of the Tibia*

Prof. Rudler: *Esophagus with Decroisement Aortique*

Prof. Mialaret: *Gastrectomy*

Prof. Aboulker: *Urologic Operations*

Dr. Iselin: *Extrafascial Apicolysis; Plastic Surgery of the Hand*

Dr. Masmonteil: *Arthroplasty of the Hip; Gastrectomy*

Dr. Mathey: *Pneumonectomy*

Dr. Oudot: *Arterial Transplantation*

Prof. Desvignes: *Corneal Transplant; Cataract*

Prof. d'Aubigne: *Orthopedic Operations*

Prof. Seneque: *Cancer of the Rectosigmoid; Vesicular Lithiasis; Preoperative Radiomanometry*

Dr. Gouverneur: *Urologic Operations*

Dr. Thalheimer: *Choliangiography*

Prof. Offret: *Ophthalmologic Procedures*

Prof. Olivier: *Radiomanometric Examination of the Biliary Passages*

Prof. Sicard: *Hernia of the Intervertebral Disc*

Dr. Ducroquet: *Surgical Treatment of the Sequelae of Poliomyelitis*

Prof. Lucien Leger: *Surrenal Pancreatography*

Wisconsin Meeting: The Wisconsin Section of the United States Chapter assembled in Marshfield on Saturday, June 2, at St. Joseph's Hospital. The meeting opened with an operative surgical clinic. Drs. P. F. Doege and C. A. Vedder had charge of abdominal surgery; Dr. R. W. Mason, of orthopedic surgery; Drs. G. L. McCormick and F. A. Wierzbinski, of surgery of the ear, eye, nose and throat; and Dr. N. J. Helland, of urologic surgery. At 11:30 a surgical clinical pathologic conference was held, under the direction of Dr. J. B. Miale, pathologist of St. Josephs Hospital. The meeting then adjourned for luncheon at the Hotel Charles.

The afternoon session, from 2 to 5 p.m., was held in the Nurses' Home Auditorium. Each paper required from fifteen to twenty minutes and was followed by a five-minute discussion. Dr. Samuel G. Higgins of Milwaukee served as moderator. A list of the presentations follows:

Intussusception — C. A. Vedder, M.D., Marshfield

Pull-Through Operation for Rectosigmoid Carcinoma—Dr. Louis Milson, M.D., Green Bay

Lymphoid Hyperplasia of the Appendix—J. B. Miale, M.D., Marshfield

Surgical Treatment of Congenital Glaucoma—G. L. McCormick, M.D., Marshfield

Report of Study of Three Hundred Consecutive Cholecystectomies—H. R. Fehland, M.D., F.I.C.S., Wausau

Some Aspects of the Grafting of Long Bones—R. W. Mason, M.D., Marshfield

Renal Salvage—N. J. Helland, M.D., Marshfield

A cocktail hour and dinner at the Hotel Charles afforded a delightful social break in the proceedings, after which two guest speakers, Dr. Durand Smith and Dr. W. M. McMillan, both of Chicago, addressed the assembly. Dr. Smith, a well known proctologist on the attending staff of the Wesley Memorial Hospital and an Associate in Surgery of the Northwestern University Medical School, spoke on *Radiation Injury to the Bowel.* Dr. McMillan, Senior Attending Surgeon at the Wesley Memorial and Attending Surgeon at Cook County Hospital, is also a professor of surgery at the Cook County Graduate School and an associate in surgery at Northwestern. He spoke on *Pitfalls and Safeguards in Surgery of the Colon.*

This meeting was an outstanding success

and an excellent example of what the various Sections are accomplishing

Colorado Surgical Section. On May 9, 1951, about 45 members of the Colorado Surgical Section of the International College of Surgeons met at the Denver Country Club The primary purpose of the meeting was to formulate plans for a Regional Meeting to be held at the Broadmoore Hotel on May 2, 1952 *Dr Harry C Bryan of Colorado Springs* was elected chairman of the Regional Meeting

Dr William Randolph Lovelace of Albuquerque, New Mexico, President-Elect of the United States Chapter of the International College of Surgeons, spoke to the group on international policy and organization

Alabama Surgical Section: At a business meeting of the Alabama Surgical Section at Mobile on April 20, 1951, Dr Otis Jordan of Tuscaloosa was elected president of the Alabama group Dr John A Martin, Montgomery, was elected Vice President and Dr Paul W Shannon, Birmingham, was reelected Secretary-Treasurer

Forty-two delegates attended the breakfast, and the surgeons voted to hold the next scientific session of their section in Montgomery in the fall

Recent Honors. Prof Dr Mooro Pasha of Cairo, Egypt, has recently been appointed Rector of the Cairo University

Prof Dr Jacob Bitschai, F I C S, Alexandria, Egypt, has been appointed to the Chair of Urological Surgery at the Faculty of Medicine, Ibrahim University, Cairo, Egypt

Officers Elected in Venezuela: From Dr Cesar Rodriguez, Secretary of the Venezuelan Society of Surgery, comes the following list of newly elected officers President, Dr *Alfredo Borjas*, Vice-president, Dr *Jorge* Gonzalez Celis, General Secretary, Dr R Baquero Gonzalez, Annual Secretary, Dr Cesar Rodriguez, Treasurer, Dr A Gonzalez Navas, and Librarian, Dr Luis H Rodriguez Diaz

Austrian Chapter: The Austrian Chapter held its annual meeting on March 5 in Vienna, at the First Surgical Clinic, which is under the direction of Prof Leopold Schonbauer The proceedings of this meeting were as follows

A *Report of the President*—Prof Dr Hans Finsterer

Prof Finsterer welcomed the members of *the Austrian Chapter and gave a brief report* on the activities of the College during the past year He spoke on the membership and growth of the Austrian Chapter

A memorial service was held for Dr H G Pleschner, F I C S, of Seefeld, Austria

B *Treasurer's Report*—Prof Dr R Oppolzer

The Treasurer presented his report, which was approved by the Auditing Committee, composed of Prof Dr E Schlander and Prof Dr H Steindl

C *Secretary's Report*—Prof Dr Felix Mandl

Prof Mandl presented to the members an invitation from Prof Dr Albert Lezius to attend the meeting of the German Chapter, *which was to be held in Munich Also, Prof* Mandl extended an invitation to the Austrian Chapter to attend the annual assembly of the Italian Chapter in Florence

D *Election of Officers*

The following officers were elected by acclimation President, *Prof Dr Hans Finsterer*, Vice-President, Prof Dr T Antoine, Secretary, Prof Dr Felix Mandl, and Treasurer Prof Dr R Oppolzer

The following Surgical Specialty Regents were elected General Surgery, Prof P Huber, Gynecology, Prof Dr H Heidler, Urology, *Prof Dr R Ubelhor*, *Otology*, *Prof Dr* E Schlander, Orthopedics, Prof Dr P Erlacher, and Emergency Surgery, Prof Dr L Bohler

An Auditing Committee of two was appointed Prof Dr E Schlander and Prof Dr H Steindl

E *New Business*

A discussion of Chapter activities in connection with the Eighth International Assembly in Madrid in 1952 was opened, Prof Finsterer expressing the hope that a good representation from Austria would be present

It was suggested that the amount of the annual dues remain the same, but after a discussion by Prof Schonbauer, it was voted to raise the annual dues to 100 Shillings Prof Mandl discussed ways and means of transmitting the Chapter's allotment of fees and dues to the International Treasurer and suggested that the central office be asked to send information regarding the transmission of funds

The meeting was adjourned

General News Notes

Essay Contest: The Foundation of the American Society of Plastic and Reconstructive Surgery offers, in its 1951 essay contest, Junior and Senior awards for original contributions in this field. The requirements of the contest are as follows:

Junior Classification

1. The contest shall be restricted to residents and surgeons in practice of plastic and reparative surgery for not longer than five years.

2. The competition is open to nationals of the American continent and British dominions.

3. The subject matter of the essay shall be the result of some *original* clinical or laboratory research in plastic surgery of recent date. Case reports will not be considered, nor papers that have been previously published.

4. All essays shall be submitted in *quadruplicate*, in English, (along with illustrations) *with no indication of the writer's name or his institutional affiliation.*

5. *The essay shall be identified by legend, and in a sealed envelope with identifying legend on the outside,* must be included name, address and affiliations of the contestant, also character references from two leading physicians in the applicant's community.

6. The essayist shall also give the following information:

(a) Name of medical school from which he graduated and date.

(b) Plastic surgery training. In what clinic or with what plastic surgeon and for how long? (Be specific as to dates, positions held, whether in a hospital or in an outpatient department, etc. Name of hospital and location.)

(c) Length of time in private practice of plastic surgery. (Please be specific as to dates.)

(d) Percentage of present practice in plastic surgery.

7. The Award Committee shall decide which of the essays shall receive the 1st or 2nd Prize consisting of a Scholarship in plastic surgery of six and three months respectively. The scholarship will be selected by the winners from an available list of accredited plastic surgery services in USA, England and Canada. The winners will also receive a certificate of merit.

Senior Classification

An award is offered for an essay by a specialist in plastic and reparative surgery on the subject: "Mass Treatment of Burns in Atomic Warfare."

All essays must be received by the chairman not later than Aug. 15, 1951.

The winning essays shall have a place with special designation on the program of the forthcoming annual meeting of the American Society of Plastic and Reconstructive Surgery to be held in Colorado Springs, Colorado, Oct. 31-Nov. 2, 1951.

The Foundation reserves the exclusive right of publishing the winning contributions in the official journal, *Plastic and Reconstructive Surgery.*

Further inquiries should be addressed to Jacques W. Maliniac, M.D., Chairman, 11 East 68th Street, New York 21, N. Y.

Formation of an eleven-man Council of Medical Education to guide the development of the projected Medical School at Yeshiva University, has been announced by Dr. Samuel Belkin, president of the University.

Dr. Harry M. Zimmerman, Chief Pathologist and head of the Laboratory Division at Montefiore Hospital, Bronx, and Professor of Pathology at Columbia University's College of Physicians and Surgeons, has been elected chairman, Dr. Belkin reported.

Dr. Donald G. Anderson, secretary, American Medical Association's Council on Medical Education and Hospitals, and Dr. John B. Pastore, Executive Director, Hospital Council of Greater New York and Assistant Professor of Clinical Obstetrics and Gynecology at Cornell University Medical College will serve as consultants to the group.

The Council comprises distinguished scientists and physicians who have wide experience in the field of medical education and administration and who have already made lasting contributions to the advancement of medical science, Dr. Belkin explained. He added that additions to the Council will be made from time-to-time.

"The Council," Dr. Belkin declared, "is making a thorough study of the particular contributions which the new Medical School of Yeshiva University can make in the field of medical science; of the most suitable site for the erection of the necessary buildings and of the many other needs for the efficient functioning of Medical and Dental Schools"

Dr Belkin stated that many other leading medical men and associations have volunteered their services in planning the Medical School which will mark the first phase of a $25,000,000 Medical Center planned by the University The projected Medical Center will contain Schools of Medicine, Dentistry, Nursing, Public Health and Post Graduate divisions

Surgical Conference in Nevada: The Second *Annual Surgical Conference* will take place *at the Riverside Hotel, Reno*, Nevada, on August 23, 24 and 25 The chairman of the program committee is Dr O C Moulton

Cushing Society Honors Publisher: Charles C Thomas, well known publisher of Springfield, Illinois, was recently presented, by the Harvey Cushing Society, a handsome plaque "in recognition of his outstanding contributions as a publisher, especially in the field of neurological surgery" The *Journal* congratulates Mr Thomas heartily on this tribute, for no such honor was ever better deserved

The International Congress of Anesthesiology: This group, organized by the French Society of Studies of Anesthesia and Analgesia, under the auspices of the Council for the Coordination of International Congresses of Medical Sciences, will be held in Paris on September 20, 21 and 22, 1951 This meeting will have its headquarters in the L'Ecole des Infirmieres of the Hospice de la Salpetriere, 47, Boulevard de l'Hopital All persons interested in Anesthesia-Reanimation are cordially invited to attend

Papers will be presented in French, English, Spanish or Italian and a summary of each report will be given in all languages

Complete information may be obtained by writing to the Secretary of the Congress, 12, Rue de Seine, Paris VIe France

International Congress on Industrial Medicine. The tenth International Congress of Industrial Medicine will be held in Lisbon from Sept 9 to 15, 1951 Professor J Maria Porto is president Considerable importance has been placed on this meeting Those interested may communicate with the Secretary of the Congress at the Instituto Nacional do Trabalho e Previdencia, Praca do Comercio, Lisbon, Portugal

Public Health Conference: The seventy-ninth annual meeting of the American Public Health Association, the eighteenth annual meeting of its Western branch and the annual meetings or thirty-eight related organizations will be held simultaneously in San Francisco, Oct 29 to Nov 2 The combined meetings are expected to bring together 5,000 health specialists from all parts of the Western Hemisphere No single theme can be utilized for a meeting of such scope, Dr Atwater said Symposiums are under development by the thirteen sections of the Association (Health Officers, Laboratory, Statistics, Engineering, Industrial Hygiene, Food and Nutrition, Maternal and Child Health, Public Health Education, Public Health Nursing, Epidemiology, School Health, Dental Health and Medical Care), are as follows *Mobilization of the Nation's* Health, International Health, Hygiene of Aging, Sanitary Aspects of the Food Supply in Time of Disaster, The Emergency Maternal and Infant Care Program—How to Do It This Time, Long-Term Illness in Children, Biological Warfare, School Health Practices Today, Air Pollution, Food Faddism, Cancer Diagnostic Programs, Medical Care for the Needy, Industrial Sanitation, The Mental Health Institute as an Education Device, Chronic Diseases, Problems in Immunization, and Water Fluoridization

Among the related organizations meeting with the Association are American Association of Registration Executives, American Association of Schools of Public Health, Association of Maternal and Child Health and Crippled Childrens Directors, Association of State and Territorial Health Officers, Commissioned Officers Association of the U S Public Health Service, Conference of Municipal Public Health Engineers, Conference of Professors of Preventive Medicine, Conference of Public Health Veterinarians, Conference of State and Provincial Public Health Laboratory Directors, Conference of State Directors of Public Health Education, Conference of State Hospital Personnel, Conference of State Sanitary Engineers, Council of State Directors of Public Health Nursing, Civil Affairs Committee of the Military Government Public Health Society, Public Health Cancer Association, and National Organization for Public Health Nursing

Local arrangements are being made under the direction of Dr J C Geiger, Director of Public Health of the City and County of

San Francisco. Headquarters will be the Civic Auditorium.

World Medical Association to Meet in Stockholm: The World Medical Association will hold its annual meeting in Stockholm, Sept. 9-23, 1951. Observers from WHO, UNESCO, and ILO have been invited to attend. The arrangements are in the hands of the International Committee of the Swedish Medical Association.

Medical Editors' Meeting: After the Fifth General Assembly of The World Medical Association in Stockholm, Sweden, September 15-20, 1951, there will be a meeting of the Medical Editors of the World, Friday, September 21. The meeting will last all day and will be held in the House of Parliament.

Those who wish to attend are requested to communicate immediately with Louis H. Bauer, M.D., Secretary General, 2 East 103d Street, New York 29, N. Y.

Argentine Assembly: The Fourth Assembly of The Society of Thoracic Surgery will be held in Buenos Aires July 2-7, 1951. A group of well known specialists in thoracic surgery from Latin America and Europe will attend the meeting. Among the latter: Prof. P. Santy of Lyon, Profs. P. Valdoni, E. Morelli and N. di Paola of Rome and Dr. H. Metras of Marseille.

Those wishing to attend are requested to communicate with Dr. Jorge A. Tiana, Honorary President.

1951 Meeting of American Society of Plastic and Reconstructive Surgery: The twentieth annual meeting of the American Society of Plastic and Reconstructive Surgery will be held at the Broadmoor Hotel, Colorado Springs, Colorado, October 31 through November 2, and will be preceded by a scientific program October 30 under the auspices of Dr. Douglas Macomber at the University of Colorado Medical School, Denver, Colorado.

The following is a preliminary outline of the program to date:

Denver

October 29: 5-7:00, Cocktail party for members, guests and wives—Dr. and Mrs. Douglas Macomber

October 30: 10-12:00, Scientific program at University of Colorado Medical Center (Colorado General Hospital)

12:30, Luncheon at Medical School

2-4:00, Clinical session, Dr. Macomber

4:30, All leave together in buses to Colorado Springs

Evening of October 30: 7:30, Dinner at Broadmoor Hotel

9:00, Executive Committee Meeting and Registration

October 31: 9-12:00, Scientific session

2-4:00, Symposium and Round Table Discussion

4:30, Business session

7:00, Cocktails

8:00, Dinner for members, guests and wives; entertainment

Colorado Springs

November 1: 9-12:00, Scientific session

Free afternoon: Recreation, excursions, Art Center, Van Bringle Pottery Works

7:00, Cocktails

8:00, Dinner for members and guests; Presidential Address

November 2: 9-12:00, Scientific session; Prize Essays of Foundation

12:30, Ladies' Luncheon

2-5:00, Motion pictures

Dr. Jerome P. Webster, 630 West 168th Street, New York City, is Chairman of the Program Committee, and he is most anxious for anyone interested in presenting a paper at the meeting to submit to him the title of the paper and a brief summary of the subject matter. Dr. Webster urges that 6 copies of this information be submitted to him not later than July 1.

Dr. Douglas Macomber, 1820 Gilpin Street, Denver, Colorado, has charge of the local arrangements; preliminary reports indicate that he has an excellent scientific program in Denver for the day preceding the meeting in Colorado Springs.

The opportunities for entertainment in Colorado Springs are many and varied—the Art Center, Van Bringle Pottery Works, Garden of the Gods, Cheyenne Mountain Zoo, skating at the Broadmoor Ice Palace, swimming in the outdoor heated pool, and other types of recreation.

Dr. W. M. Adams, Secretary, suggests that you write directly to the following hotels for your reservations: Denver, the Cosmopolitan Hotel or the Brown Palace Hotel; and Colorado Springs, the Broadmoor Hotel.

New Books

Textbook of Medicine. Edited by Russell L Cecil and Robert F. Loeb, in association with Alexander B Gutman, Walsh McDermott and Harold G Wolff Philadelphia and London: W. B. Saunders Company 1951 8th ed Pp 1627, with 201 illustrations

The eighth edition of this well known work, to which 168 authors have contributed, is remarkable for the completeness of its coverage and the clarity of its presentation. Every known disease in the field of internal medicine is discussed, and all available modern data are brought to bear on the problems connected with each. With such an impressive array of competent contributors each giving of his best in his special field, it is small wonder that the result is excellent.

Many fine extensions and additions to the former work are included. The section on psycho-omatic medicine is especially interesting. Throughout the [illegible] phasis is laid upon the [illegible] and biochemical aspects [illegible]

Despite the inclu[illegible] the new edition is [illegible] predecessor, [illegible] ciency of the editor [illegible] the material [illegible] highly [illegible] they [illegible]

A Textbook of [illegible] Head and Neck [illegible]

[illegible]

simplifying and illuminating the text. Each chapter is followed by a well organized and [illegible] dependable references. Not only the [illegible] but the [illegible] surgeon and the practitioner in general surgery will find in these pages many valuable accretions to his fundamental stock of knowledge.

The American Illustrated Medical Dictionary. By W A Newman Dorland Philadelphia and London W B Saunders Company 1951 [illegible] ed Pp 1,[illegible] Illustrated

This classic standby of medical and nursing students, practitioners, [illegible] and editors has reached its [illegible] which it celebrates with a magnificent new edition, greatly enlarged and improved. [illegible]

[illegible]

tific contributors of varying nationality. The task was a huge one, but it has been well done. Any researcher in the medical or surgical literature of the world will value it highly in the pursuit of his studies. Contributors to scientific journals, as well as the editors thereof, will do exceedingly well to take advantage of it.

Tratado de Ginecologia e de Tecnica Terapeutica Ginecologica. By V. Conill Montobbio, with the collaboration of Victor Conill Serra. Barcelona: Editorial Labor, S. A., 1950, with the collaboration of Victor Conill Serra. 2d ed. Pp. 775, with 459 illustrations, including some in color and 1 plate.

The second edition of this outstanding work gives a thorough review of the world literature in the field of gynecology, including the recent advances in therapeutics, physiology and hormone therapy. It presents detailed descriptions of modern gynecological technics which are now used by the leading gynecologists.

The book presents the personal experiences and the methods of the authors. Original methods are described, modified and extended, for example, Wertheim's operation, the correction of uterine prolapse, cauterization of the urethra in urinary incontinence, injections of oil in the tubes for sterility and many other technics.

The work is authoritative, well organized and indexed. The publishers have spared no effort in enhancing the value of the book by excellent reproductions of the illustrations and careful selection of type and arrangement. The work can be recommended unreservedly to students, general surgeons and even specialists in gynecology, as well as to all engaged in the practice of medicine who keep abreast with modern scientific advancement.

Syllabus of Human Neoplasms. By R. M. Mulligan. Philadelphia: Lea & Febiger, 1951. Pp. 317, with 230 illustrations.

Basing his work upon the conviction that a sound and thorough knowledge of the embryologic and histologic character of the cells that compose tissues and organs, the author devotes much careful attention to these aspects of the study of neoplastic growth. His book comprises eleven well organized chapters, covering in succession all of the various types of tumor that affect the human body. The discussions are classified under type rather than location; e.g., leiomyoma or lymphosarcoma, as the case may be, is discussed with regard to all its implications and possible sites of occurrence. This obviates the necessity of repetition and makes for clarity and conciseness of presentation.

Dr. Mulligan has been at pains to avoid more than necessary use of new and unfamiliar terms. The book is therefore a ready source of information, which should be of value to the medical student and the young physician or surgeon as well as to those of experience. The excellent photomicrographs, with their explanatory legends, add much illumination to the text.

The Roentgen Manifestations of Pancreatic Diseases. By Maxwell Herbert Poppel, Springfield, Illinois: Published by Charles C Thomas, Publisher, 1950. Pp. 366, with 166 illustrations.

Pancreatic disease is achieving greater notice and importance than heretofore because of the advances made in physiology, pathology and surgical technic as related to diseases of the pancreas. The work is therefore timely and should be a welcome addition to every progressive surgeon's library. Certainly roentgenologists should study its pages, from which they will garner a great deal of additional information. A detailed analysis would be superfluous, because every page of the work is replete with worth-while information. To date this appears to be the best work on the subject presented. The arrangement of the chapters is excellent. The illustrations are exceptionally well selected and presented. There is a comprehensive and thorough index at the end of the work. The publishers have done a highly commendable job in presenting the meritorious text on a backdrop of fine production, excellent printing and selection of paper.

Abstracts from Current Literature

Case of Gastrocolic Fistula of an Ulcer on the Lesser Curvature of the Stomach Paraskevas, M, and Petropoulos, P, El linki Iat February 1948

The authors report a rare case of gastro colic fistula due to an ulcer of the lesser curvature, observed at the surgical clinic of the State General Hospital in Athens

The patient, a man aged 53 had suffered for seventeen years with reflex pain in the left shoulder, acid eructations, 'heartburn" and frequent hemorrhage and retching The ulcer having been diagnosed, Dr Paraskevas operated on Dec 17, 1946 Operation confirmed the diagnosis, and ulcer of the lesser curvature, located 3 fingerbreadths above the corner of the stomach, had perforated into the transverse colon During preparation of the stomach the ulcer was half opened and its full connection with the colon could be observed The walls of the latter were a little hardened in the ulcer area The fistulous aperture was the size of a large lentil and was located on the posterior wall of the transverse colon, a little above the point at which the mesocolon was attached The hardened edges of the aperture were resected and closed by a transverse three layer suture technic A typical Reichel Polya resection of the stomach was performed, with an antecolic gastrojejunostomy and a small jejunosotomy according to Braun

The postoperative course was entirely normal The patient left the hospital on the nineteenth postoperative day and has been well since

This case appears unique of its kind In a search of the international literature from 1914 to 1944 the authors found only 1 similar case (Finth, *Lancet*, 1920), and in this single case the data were obtained only at autopsy

JOHN G ZACHARAKOPOULOS, M D

Hirschsprung's Disease in Infancy Burnard, E D, Brit M J 1 151, 1950

At Children's Department, Newcastle upon-Tyne General Hospital, 7 babies with Hirschsprung's disease were followed from a few days after birth to the age of 8 months Vomiting was the first symptom, followed by distention and delay in the passage of meconium As the distention increased, ladder patterning of the small intestine was seen This condition was relieved by digital manipulation of an enema A great deal of flatus and meconium was passed, the vomiting ceased, and further meconium stools and then feces were passed normally for a few days

Three of these babies were readmitted to the hospital in a few days vomiting, distended and constipated somewhat dehydrated and seriously underweight, and a fourth was desperately ill with fecal vomiting One died in the third month after a transverse colostomy, and another died at the age of 4 months after becoming chronically distended with inadequate response to enemas and purgatives At the age of 6 months, 4 of the remaining babies were again constipated and pot bellied, with bulky fecal masses in the abdomen, and all of them had roentgenographically demonstrable megacolon

Of the 23 records reviewed, ages at death in the hospital were in 1 case, six days, in 3, eight to ten days, in 4, one month, and in 5, one to three months Four children died at home within a few weeks of their discharge from the hospital One died suddenly at the age of 4 years with dilatation and hypertrophy of the colon as far as the lower sigmoid, no other cause of death being found Five of the hospitalized children were operated upon (four laparotomies and one colostomy), and all died within forty eight hours

Proof of the true nature of the condition was established by roentgenologic means Once meconium had been passed and later feces, other causes of intestinal obstruction of the newborn, notably meconium ileus, organic atresia and malrotation of the bowel, were ruled out The pathologic segment varied in length and appearance A stringlike narrowing was demonstrated once in all the subjects, though only a relative diminution in caliber over the same part of the intestine might be seen in other films

The main purpose of this report is to present evidence that the disease is not as uncommon in young babies as might be expected from its incidence later in childhood, and that it can be diagnosed with fair certainty on the appearance of the earliest symptoms A high mortality rate is indicated, and some attempt is made to describe the great variability of its course in infancy and later As a criterion of severi icture in the neonatal period eading, a rm- ing stat ction b patible with a mild later course.

The lack of agreement on the best management of megacolon and the inconstant results of a number of surgical procedures tried in the last thirty years, are the easier to understand now that the dyschizia group, with its good prognosis, has been isolated and the cause of Hirschsprung's disease demonstrated. The two-stage operation devised by Swenson and Bill (Surgery *24* : 212, 1948), rectosigmoidectomy with restoration of bowel continuity, is likely to be employed on an increasing scale. Its extension to infants, however, is subject to two reservations. First, surgical measures have little place at the time fo the earliest symptoms, no matter how bad they seem, as longer observation is needed to decide the severity of the condition. Second, of patients who deteriorate in the following weeks or months there will be some in whom the affected segment is too long to permit excision and approximation of the upper portion to the anus. Swenson, Newhauser and Pickett (Pediat., *4* : 201, 1949), have successfully performed a one-stage operation in 3 cases, the youngest patient being 3 months of age. Radical measures at such an early age, before dilatation and hypertrophy have become established, obviate the need for temporary colostomy to allow the bowel to resume its normal size.

HENRY J. ROSEVEAR, M.D.

On the Postoperative Gastrojejunal-Colic Fistula. Paraskevas, M., and Petropoulos, P., Helinki Iat., March 1947.

The authors describe in detail the incidence, cause, symptoms, diagnosis, prognosis, prophylaxis and treatment of this type of fistula, with a minute analysis of the conclusions to be drawn from cases reported in the international literature. Thirteen operative cases observed in Dr. M. Makkas' clinic are reported. Three of the patients, on whom resection of the stomach, jejunum and colon was performed, were cured, as were 7 others who had undergone wide resection of the stomach with or without resection of the jejunum. This signifies a total of 10 radical operations without a death.

Moreover, 3 patients for whom conservative operations were ordered and performed did not recover. On 1 a simple preliminary jejunostomy was performed; on the second, separation of the fistula and anastomosis and resection of the transverse colon, the resulting orifices being attached by an anterior anastomosis; and on the third, coaptation of the edges of a perforated peptic ulcer in the free peritoneal cavity.

Five of the 10 cured patients were reexamined at intervals ranging between one and one-half years and ten years after the operations, and all cures were evidently permanent.

JOHN G. ZACHARAKOPOULOS, M.D.

Intraperitoneal Intestinal Anastomosis in Colectomy. Hendry, W. G., Brit. M. J., Nov. 18, 1950, p. 1148.

Presenting an excellent summary of observations upon 15 cases in which he performed segmental resections of the colon for obstructing lesions, the author compares the attention the subject has received in the American and in the British literature. He considers it probable, in view of the dearth of information on the subject in British journals, that the extraperitoneal methods of Paul and Mikulicz "are still in vogue up and down the country in cases that would be eminently suitable for an intraperitoneal method." He notes that the present difference in risk between the two procedures is slight now that the principles of colonic surgery have been altered by the chemotherapeutic agents available today, and suggests that the end-to-end anastomosis is a much better procedure both mechanically and physiologically. There is an adequate discussion of the advisability of end-to-end anastomosis, dependent upon the degree and duration of obstruction, and of the preliminary surgical decompression occasionally necessary.

There were no cases of carcinoma of the rectosigmoid junction included in this series of operations performed over the five-year period 1946-1950, and only 1 case of benign disease, obstruction from diverticulitis. Four of the operations were done without hope of eradicating all the evident areas of carcinoma extension within the abdomen. There was 1 surgical death on the second postoperative day from "pulmonary insufficiency." In 3 cases preliminary proximal surgical decompression had been carried out. The insoluble sulfonamide used was 1 Gm. daily of sulfathalidine for the five days preceding operation. There is an excellent discussion of the influence of the site of the lesions, the type of anastomosis to be employed, the effects of chemotherapy, preoperative management, anesthesia, operative procedure and postoperative care. Two cases are discussed in detail.

LOUIS RIVER, M.D.

Aspiration of the Heart in Air Embolism. Stallworth, J M , Martin, James B , and Postlehwait, R W. J A M A 2 1250, 1950

Two types of air embolism are known one is pulmonary and the other arterial Arterial embolism results from entrance of air into the left side of the heart from the pulmonary veins or through a patent foramen ovale In venous embolism air enters a systemic vein and is carried to the right side of the heart The symptoms of arterial embolism depend on the site of occluded peripheral arteries In the presence of venous embolism the result is filling of the right side of the heart with 'blood foam"

Experimentally aspiration of the right ventricles of dogs in the management of venous embolism has been of value

The case is reported of a patient in whom venous embolism occurred during an exploratory laparotomy The heart became irregular and a harsh bubbling rumble was heard over the cardiac area Fifteen cc of air and blood were withdrawn from the right heart through a No 20 spinal needle Some blood was then reinjected into the heart and more air withdrawn The blood pressure promptly returned to normal and the patient improved Death occurred, however, on the nineteenth postoperative day Autopsy revealed atypical periarteritis nodosa

M T FRIEDELL, M D

Fracture of Ribs: a Logical Treatment. Coleman, F P, and Coleman, C L, Surg, Gynec & Obst 90 129, 1950

The authors report their method of open reduction and fixation by wire, or by intramedullary peg and wire, of multiple rib fractures Although repeated intercostal nerve blockings may be sufficient for the simple and singular fractures, such a method of treatment is totally inadequate for fractures associated with intrathoracic injury, possible intraabdominal injury, paradoxical motion of the chest wall, instability of the fracture fragments of the lower six true ribs, and severe pain Maintaining the integrity of the chest wall is essential to maintaining intrathoracic physiologic function and life External skeletal traction is described as cumbersome and ineffective, strapping compression of the chest is obviously contraindicated The authors have not used the Drinker respirator in the 11 cases reported In their surgical treatment, fracture pain was immediately abolished and the normal physiologic character of the thorax restored The procedure is described adequately and illustrated by excellent photographs

ELIAS N KAISER, M D

A New Method for the Early Diagnosis of Acute Appendicitis in the Absence of Localization. Keyes, E L, Surg Clin North America 30 1447, 1950

Nonlocalization has been the chief cause of delay in the diagnosis of acute appendicitis It has been recommended that in diagnosis the chief emphasis should be put on physical examination of the abdomen and that the history be regarded as next in importance The author proposes a reversal of emphasis, putting more weight upon the history than upon the physical signs

In the characteristic history of a patient with acute appendicitis pain begins in the midline and persists there for eight or more hours Anorexia and a downward urge to defecate accompany the midline pain This characteristic early history was noted in 88 per cent of patients with nonlocalization and in 74 per cent of patients with localized acute appendicitis

Pain in acute nonlocalizing appendicitis begins in the midline, it is epigastric or hypogastric about the umbilicus or generalized in the abdomen The initial midline pain has been found to persist for eight hours or more It persists without remissions, in spite of defecation and diarrhea Anorexia, which is more common than either nausea or vomiting, was observed in 95 of 100 patients The downward urge to defecate was noted in 95 per cent of the patients with acute nonlocalizing appendicitis during the first eight hours of illness Midline pain persisting for eight or more hours, plus a downward urge are equally characteristic of acute appendicitis and acute obstruction of the ileum Vomiting is more common and persistent in the latter Peristaltic rushes can be heard early in cases of acute obstruction of the ileum and are synchronous with the pain Prostration during the first eight hours is more severe in obstruction than in appendicitis

The early diagnosis of acute appendicitis has proved feasible, even in the absence of localization, by obtaining the characteristic history during the first eight hours of (1) persistent midline pain, (2) anorexia and (3) the downward urge to defecate

H J ROSEVEAR, M D

Mitral Stenosis: Its Surgical Treatment by Commisurotomy. Glover, R. P., O'Neill, T. J. E., and Bailey, C. P., Pennsylvania M. J. 53:375, 1950.

Sir Lauder Brunton, as early as 1902, concluded that direct surgical incision of the stenotic valve provided the only logical method of interrupting the relentless chain of events attendant upon progressive mitral stenosis. The prognosis of an individual case of mitral stenosis depends upon many factors: the age of the patient, the severity of the lesion, the presence or absence of other valve defects, the presence or absence of additional rheumatic activity, and the condition of the myocardium. The authors state, however, that under these conditions the ultimate outcome is unfavorable once the stenotic change gives rise to a progressive pattern.

The authors report fourteen attempts since 1929, exclusive of their own, to relieve mitral stenosis by various punch or plastic procedures upon the valve itself. They outline three methods of approach to the problem of mitral stenosis: (1) by-passing the stenotic mitral valve; (2) relieving the associated pulmonary hypertension, and (3) directly attacking the stenotic valve. For the latter method the approach to the mitral valve via the auricular appendage is preferred by the authors. The finger or instrument is well tolerated in the roomy left auricle unless the actual passage of blood into the ventricle is obstructed for more than three beats. In addition, the appendage may be readily and securely ligated at completion of the operation.

The surgical procedure favored is an approach to the left auricular appendage through the third left rib or the inframammary fold. This includes removal of the third rib and the costal cartilage. The pleura is opened through the incised rib bed; the pericardium is incised. Care must be taken not to extend the incision too far toward the apex, lest the heart have a tendency to herniate from its sac. The pericardial sac is sprayed with 5 per cent procaine. A purse string suture is passed about the auricular appendage to a portion previously anesthetized by procaine injection. By a two-glove technic a knife blade is held on the index finger and the finger is inserted into the left auricle. The valve is located and explored, and its size and structure delineated. The anterolateral commissure is divided first. The finger again palpates the opening and gently dilates it.

Sixteen cases in which this method was employed are reviewed in this report. In 8 cases commissurotomy alone was performed, with 4 satisfactory results, 1 fair result, and 3 deaths. Since publication 22 additional patients have undergone operation. In a total of 30 cases there have been 6 in which commissurotomy alone was the method of treatment. In 24 living patients the results have been very satisfactory up to date of publication.

MORRIS T. FRIEDELL, M.D.

The Growth Conditions of Gallstones and Some Related Problems. Brandberg, R., Acta Chirurgica Scandinavica 100:41, 1950.

The author has collected 54 cases in which gallstones could be visualized roentgenologically at significant intervals. These he divided into three groups:

1 (8 cases). Normal cholecystogram obtained at first examinaion, but stones seen in later ones.

2 (11 cases). The size of the stone was found unchanged after intervals varying from one and one-half to thirteen years.

3 (35 cases). Obvious growth occurred in time intervals varying between one and sixteen years.

In summing up his observations, the author concludes that in a packed gallbladder the size of the stones remains stationary owing to lack of material for their growth—concentrated bile. The length of the past history cannot be used to estimate the length of time the patient has had gallstones. When stones occur simultaneously in the gallbladder and in the common duct, those in the duct are usually the size of the largest in the gallbladder; in a minority of cases they are smaller, and rarely they are larger; i.e., stones in the common duct grow at a rate similar to those in the gallbladder. Stones removed long after previous cholecystectomy are approximately the same size as the largest in the previously removed gallbladder, so that after cholecystectomy, common duct stones grow slowly if at all. This is due to the fact that in the former there is concentrated bile in the common duct, whereas in the latter there is only thin, hepatic bile.

HOWARD S. STERN, M.D.

Armamentarium

New Hematinic for Hypochromic Anemia: Lakeside Laboratories announces the introduction of Ferrophyll, a new hematinic for rapid and sustained theapeutic response in hypochromic or secondary anemias Containing exsiccated ferrous sulfate 200 mg, sodium potassium copper chlorophyllin 25 mg and vitamin B_1 2 mcg, Ferrophyll tablets accelerate blood regeneration and are especially valuable in the treatment of acute anemia secondary to chronic hemorrhage

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Information on Diabetes: The U S Public Health Service Federal Security Agency, today announced the availability of a kit of audiovisual materials for patient education in diabetes The kit is intended for use by physicians, nurses, dietitians and other professional workers engaged in the instruction of diabetic patients with regard to insulin treatment, diet control and other important aspects of the disase The kit is available for purchase and, in some instances, for loan It requires the use of a 33 1/3 r p m record player and a 35 mm film projector It contains 11 colored filmstrips, 11 phonograph records, 1 "Guide for Instructors," 1 "Diabetes Guide Book," 1 "Meal Planning with Exchange Lists," 1 set of booklets for patients and 12 colored wall charts

Complete kits may be purchased from Health Publications Institute, Inc, 216 N Dawson Street, Raleigh, North Carolina Full information about the kit, its price, packaging and use, may be obtained directly from that organization Persons wishing to obtain the kit solely for preview may borrow it from their state health departments Those wishing kits for short-term loan may get them from the Film Library, Communicable Disease Center, Public Health Service, Atlanta, Georgia

Accessory Duplicating Devices: Office duplicating machines will now be able to reproduce printed matter on paper stocks hitherto unsuitable, and with a quality approaching that of lithography and printing, the Michael Lith Company of New York has announced. By an ingenious device costing less than $50, a spray of fine dry powder makes an invisible coating on every sheet that comes out of the Multilith or Davidson duplicating machine The powder keeps the sheets separated to prevent offsetting, thus permitting the office machine to run coated and card stock previously too difficult to handle successfully

The new device is called the Anti-Offset Jobmaster It has no moving parts and is easily attached to the Multilith or Davidson duplicating machines Among its other benefits, the Jobmaster permits the office machines to obtain a better ink coverage and to reduce the amount of paper spoiled

The Anti Offset Jobmaster is now used in many offices of large New York firms A demonstration or descriptive literature may be obtained from the Michael Lith Company, 145 West 45th Street, New York 19, N Y

In Memoriam

EDWARD GILLETTE MARTIN

M.D., F.A.C.S., F.I.C.S.

Dr. Edward Gillette Martin, prominent Detroit proctologist and a member of the Examining Board on Proctology, United States Chapter, International College of Surgeons, died recently, after a long and fruitful professional career, at the age of 70.

A native of Reed City, Michigan, Dr. Martin was graduated in 1904 from the Wayne University College of Medicine and served his internship at the Harper Hospital in Detroit. For many years he was chief of the proctologic departments of the Harper Hospital and the Detroit Receiving Hospital. He served in the capacity of a consultant at Grace Hospital and Florence Crittenton Hospital. He was a member of the staffs of the Detroit Memorial Hospital, the Highland Park General Hospital, St. Mary's Hospital and the Detroit Tuberculosis Sanatorium, and an emeritus professor of proctology at the Wayne University College of Medicine. His entire practice was concentrated on proctology.

Dr. Martin was a member of the American Medical Association, the Wayne County Medical Society (past president), the Michigan State Medical Society, the American Proctologic Society (past president), the Detroit Academy of Surgery, the American College of Surgeons and the International College of Surgeons. He was also a member of the central certifying committee in proctology of the American Board of Surgery.

His colleagues in these organizations, as well as his many friends, will miss him sorely. The College extends heartfelt condolences to the bereaved.

WILLIAM WALLIS SMITH

M.D., F.A.C.S., F.I.C.S.

On March 4, 1951, William Wallis Smith of Springfield, Missouri, died at the age of 61. Born in Marshfield, Missouri, Dr. Smith took his academic training at Drury College at Springfield and the University of Missouri and was graduated from Rush Medical College in Chicago. His postgraduate work was done at the University of Vienna and the University of London. He served his hospital internship at the St. Louis City Hospital and the Cook County Hospital in Chicago. Dr. Smith was for many years Chairman of the Executive Committee and Chief of Surgery of the Springfield Baptist Hospital. He had also served on the associate staff of St. John's Hospital and Burge Hospital, both in Springfield. His practice was devoted exclusively to general surgery.

Dr. Smith was a member of the American Medical Association, the American College of Surgeons, the Missouri State Medical Society, the Greene County Medical Society and the International College of Surgeons.

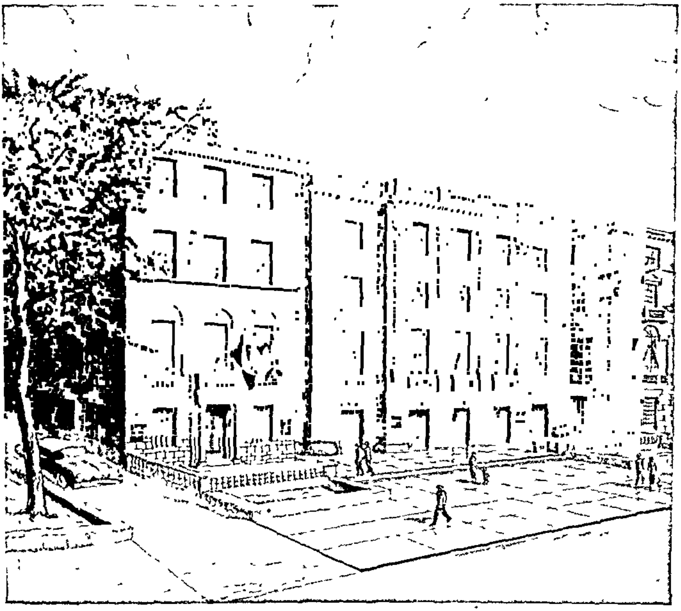
JOHN DAWSON HAYWARD

M.D., A.I.C.S.

Dr. John Dawson Hayward of St. Louis, Missouri, recently passed away at the age of 65. Dr. Hayward received his medical degree from Barnes University and did postgraduate work at Washington University, the Chicago Laboratory of Surgical Technique and the Mayo Clinic. He served his hospital internship at the Mayfield Sanitarium.

Dr. Hayward was on the active surgical staff of the St. Louis County Hospital, the Christian Hospital and the Joseph Heitkamp Memorial Hospital, serving at the Deaconess Hospital on the associate surgical staff. He was also on the courtesy staff of St. John's Hospital, St. Anthony's Hospital, the Lutheran Hospital, the Jewish Hospital and the Missouri Baptist Hospital. At one time he held a professorship at the National University of Arts and Sciences. His practice was devoted to general surgery.

Dr. Hayward was a member of the American Medical Association, the Missouri State Medical Association, the St. Louis County Medical Society, the Mississippi Valley Medical Association, the Southern Medical Society, the Southeast Missouri Medical Association, the St. Louis Medico-Chirurgical Society, the Academy of Science and the International College of Surgeons.



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